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SHARP 20LK32 SERVICE MANUAL

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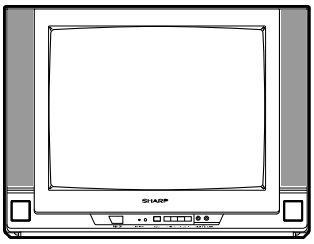
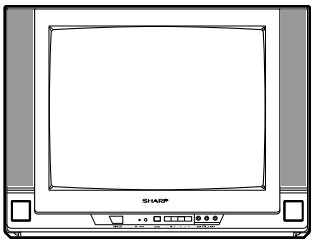
SHARP SERVICE MANUAL

S81Z420LK32//

20LK32 20LK62





COLOR TELEVISION

Chassis No. MSA

MODELS 20LK32 20LK62

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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ELECTRICAL SPECIFICATIONS

POWER INPUT ..... 110-220 V AC 50/60 Hz
POWER RATING
  20LK32 ..... 72 W
  20LK62 ..... 79 W
PICTURE SIZE ..... 1,194 cm^2 (185sq inch)
CONVERGENCE ..... Magnetic
SWEEP DEFLECTION ..... Magnetic
FOCUS ..... QPF Electrostatic
INTERMEDIATE FREQUENCIES
  Picture IF Carrier Frequency ..... 45.75 MHz
  Sound IF Carrier Frequency ..... 41.25 MHz
  Color Sub-Carrier Frequency ..... 42.17 MHz (Nominal)
AUDIO POWER
  OUTPUT RATING
    20LK32 ..... 1.5 + 1.5 W (at 10% distortion)
    20LK62 ..... 3.0 + 3.0 W (at 10% distortion)
SPEAKER
  SIZE ..... 9 × 5 cm oval (2pcs.)
  VOICE COIL IMPEDANCE
    20LK32 ..... 32 ohm at 400 Hz
    20LK62 ..... 4 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE
  VHF/UHF ..... 75 ohm Unbalanced
TUNING RANGES
  VHF-Channels ..... 2 thru 13
  UHF-Channels ..... 14 thru 69
  CATV Channels ..... 1 thru 125

Specifications are subject to change without prior notice.

IMPORTANT SERVICE SAFETY PRECAUTION

■ **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
   To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
   Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

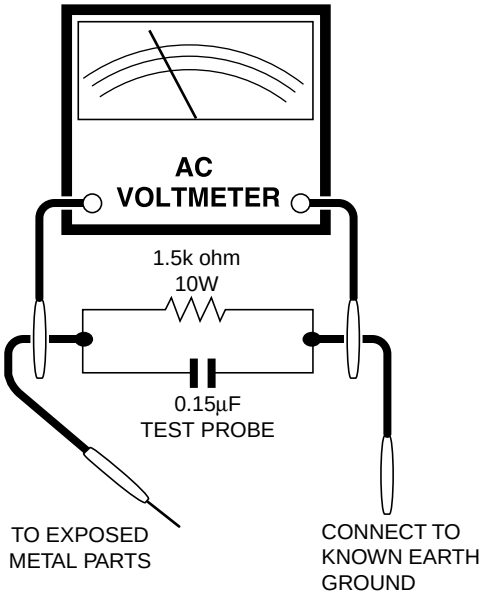
BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators and etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 110~220 volt AC outlet, (Do not use an isolation transformer for this test).
- Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.
  AII checks must be repeated with the AC ine cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)
  Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



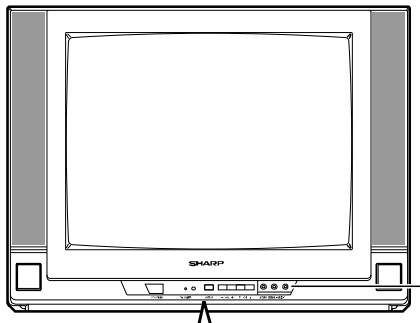
SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

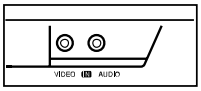
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

LOCATION OF USER'S CONTROL

Front Panel

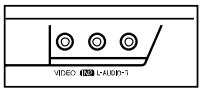


(20LK32)

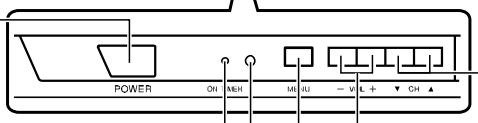


VIDEO/AUDIO IN TERMINALS
(VIDEO/AUDIO terminals are also provided on the rear.)

(20LK62)



VIDEO/AUDIO IN2 TERMINALS



POWER
Press → On.
Press again → Off.

ON TIMER indicator.

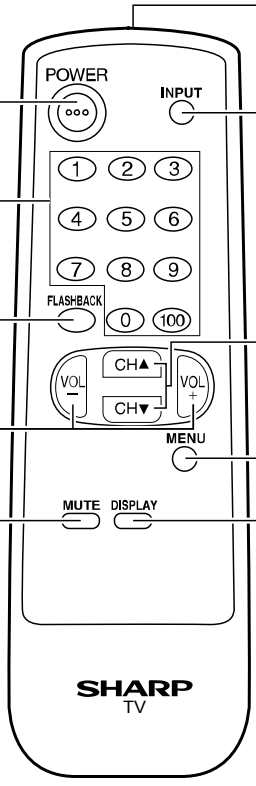
SENSOR AREA FOR REMOTE CONTROL

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.

MENU
Press ; Accesses MAIN MENU.
Press again ; Exits MAIN MENU.

Basic Remote Control Functions



Infrared Transmitter Window

POWER
Press → On.
Press again → Off.

REMOTE KEYPAD
Accesses any channel from keypad.

FLASHBACK
Returns to previous channel.

VOLUME UP/DOWN
(+) Increases sound.
(–) Decreases sound.
• In menu mode, changes or selects the TV adjustments.

MUTE
Press → Mutes sound.
Press again → Restores sound.
• CLOSED CAPTION appears when sound is muted.

INPUT
Press → Switch to external video input mode.
Press again → Switch to TV mode. (20LK32)

Press → Switch to external video INPUT 1 mode.
Press 2 times → Switch to external video INPUT 2 mode.
Press 3 times → Switch back to the original TV mode. (20LK62)

CHANNEL UP/DOWN
(▲) Selects next higher channel.
(▼) Selects next lower channel.
• Moves the " ⬍ " mark of the MENU screen.

MENU
Press → Accesses MAIN MENU.
Press again → Exits MAIN MENU.

DISPLAY
Press → Displays receiving channel for 4 seconds.
Press again→ Display Clock
Press again→ Removes display.
• Temporarily displays receiving channel when in Closed Caption mode.

INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 3.15A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

+B DC REGULATOR CONFIRMATION

The + B DC output voltage adjustment is not included in this circuit.However, should confirmation be reguired proceed as follows.

1. Actuate receiver with 220V AC input voltage.
2. Receive a local channel.
3. Connect positive lead of digital voltmeter to C754 positive side on PWB-A ; negative lead to chassis ground.
4. Confirm this voltage reading is as below.

CAUTION: The reading should be within +130.0 ± 2.0V DC to ensure normal function and circuitry reliability.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 220V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads 21.4 ± 1.5 V.
5. Apply external 27.9V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 110~220V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Receve a good local channel.
4. The voltage should be approximately, 25.5kV (at pictuer MAX Bright center condition).
   If a correct reading cannot be obtained, check circuitry for malfunctioning components.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required. See "Table-B" to determine, if service adjustments are required.

1. Service mode

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer controls are in their proper (reset) position.

2. Service item selection

Once in the service mode, press the Ch-up or Ch-down button on the remote controller or at the set. The service adjustment item will vary in increments of one. Select the item you wish to adjust.

3. Data number selection

Press the Vol-up or down button to adjust the data number.

To enter the service mode and exit service mode.

Make a short circuit JA137 & JA138 for 1 second and release to switch to the service mode position, and the microprocessor is in input mode.(Adjustment through the I^2C bus control.)
To exit the service mode, turn the television off by pressing the power button.

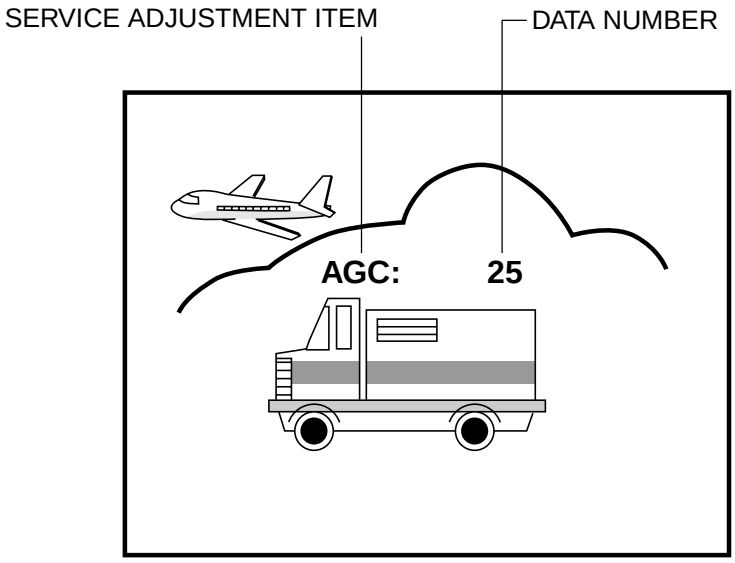
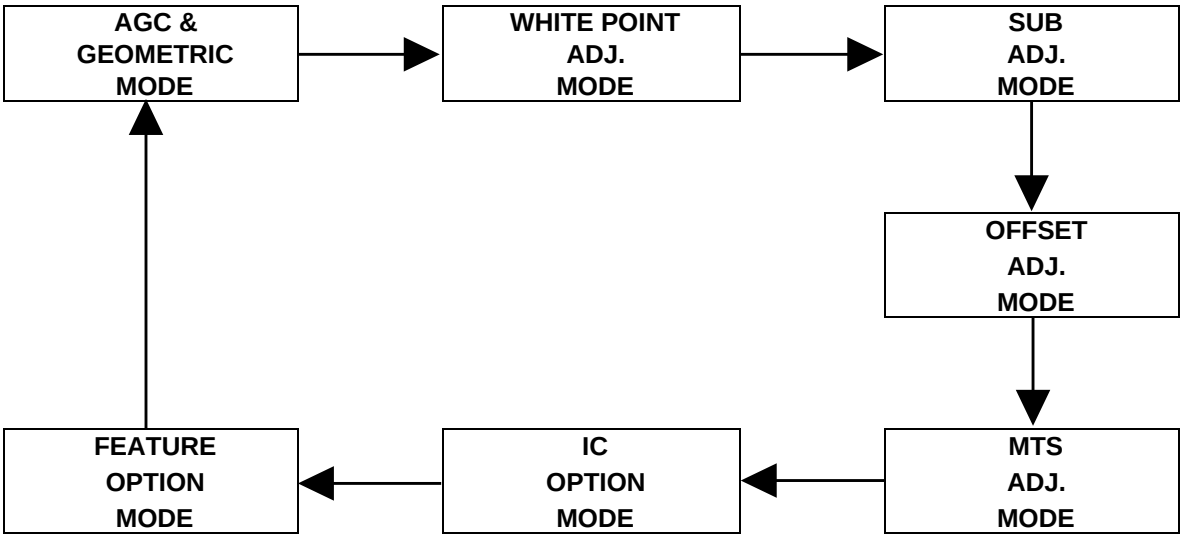


Figure A.

■SERVICE MODE

(1) In the Service Mode, Key is used to select the mode in the following order.



AGC & GEOMETRIC MODE

↓
AGC TAKE OVER POINT (AGC)
↓
VERTICAL SLOPE (V-LIN)
↓
VERTICAL AMP (V-AMP)
↓
VERTICAL SHIFT (V-CENT)
↓
VERTICAL ZOOM (V-ZOOM)
↓
HORIZONTAL SHIFT (H-CENT)
↓
EAST-WEST WIDTH (H-SIZE)
↓
HORIZONTAL PARALLELOGRAM (EW//)
↓
EAST-WEST PARABOLA / WIDTH (PARA)
↓
EAST-WEST UPPER CORNER PARABOLA (COR(U))
↓
EAST-WEST LOWER CORNER PARABOLA (COR(L))
↓
EAST-WEST TRAPEZIUM (TRAPE)
↓
HORIZONTAL BOW (HB)
↓
S-CORRECTION (S-COR)

WHITE POINT ADJ. MODE

↓
W.P. RED OFFSET HIGH / OFFSET BLUE TONE (DRI-R-HI)
↓
W.P. GREEN OFFSET HIGH / OFFSET BLUE TONE (DRI-G-HI)
↓
W.P.BLUE OFFSET HIGH / OFFSET BLUE TONE (DRI-B-HI)
↓
W.P. RED MH / STD (DRI-R-MH)
↓
W.P. GREEN MH / STD (DRI-G-MH)
↓
W.P. BLUE MH / STD (DRI-B-MH)
↓
W.P. RED OFFSET ML / OFFSET RED TONE (DRI-R-ML)
↓
W.P. GREEN OFFSET ML / OFFSET RED TONE (DRI-G-ML)
↓
W.P. BLUE OFFSET ML / OFFSET RED TONE (DRI-B-ML)
↓
W.P. RED OFFSET LOW (DRI-R-LO)
↓
W.P. GREEN OFFSET LOW (DRI-G-LO)
↓
W.P. BLUE OFFSET LOW (DRI-B-LO)

SUB ADJ. MODE

↓
MAX VOLUME (SUB-VOL)
↓
SUB CONTRAST (SUB-CON)
↓
SUB TINT (SUB-TINT)
↓
SUB COLOUR (SUB-COL)
↓
SUB BRIGHTNESS (SUB-BRI)
↓
SUB SHARPNESS (SUB-SHP)
↓
MAX HOTEL VOLUME (HTL-VOL)
↓
HOTEL PROGRAM NO(HTL-PRG)
↓
BLUE BACK CONTRAST (BB-CON)
↓
OSD GRB REFERENCE (RGB)
↓
BLACK LEVEL OFFSET R(CUT-R)
↓
BLACK LEVEL OFFSET G(CUT-G)
↓
CATHODE DRIVE LEVEL(CDL)

OFFSET ADJ. MODE

↓ Y-D TIME (TV) [YD] (DL-TV)
↓ Y-D TIME (AV) [YD] (DL-AV)
↓ INITIAL/DEFAULT LANGUAGE (INIT)
↓ FAO-MAX VOLUME (FAO-VOL)
↓ ENERGY SAVE OFFSET (ESV_OFFS)
↓ CLOSE CAPTION POSITION (CCPOS)

MTS ADJ. MODE

↓ ATTENUATE INPUT SIGNAL LEVEL (ATT)
↓ VCO FREE RUNNING FREQUENCY ADJ. (VCO)
↓ STEREO, SAP, DBX FILTER ADJ. (FILTER)
↓ STEREO SEPARATION ADJUSTMENT (300HZ) (WIDEBAND)
↓ STEREO SEPARATION ADJUSTMENT (3kHZ) (SPECTRAL)
↓ BASS LEVEL (BASS)
↓ TREBLE LEVEL (TREBLE)

IC OPTION MODE

↓ VERTICAL SCAN DISABLE (VSD)
↓ BLACK STRETCH (BKS)
↓ AUTOMATIC VOLUME LEVELLING (AVL)
↓ FAST FILTER IF-PLL (FFI)
↓ ENABLE VERTICAL GUARD (EVG)
↓ EHT TRACKING MODE (EHT)
↓ OVERSCAN SWITCH OFF (OSO)
↓ AUTO COLOUR LIMIT (ACL)
↓ FORCED COLOUR-ON (FCO)
↓ VIDEO MUTE AT IDENT LOSS (VMI)
↓ VIDEO MUTE AT PROGRAM/SOURCE CHANGE (VMC)
↓ HOTEL MODE (HTL)
↓ GAIN FM DEMODULATOR (BTSC)
↓ CHARGE PUMP (CP)
↓ FM WINDOW SELECTION (FMWS)
↓ SOUND MUTE BIT 0 (SM0)
↓ SOUND MUTE BIT 1 (SM1)
↓ IF AGC SPEED BIT 0 (AGC0)
↓ IF AGC SPEED BIT 1 (AGC1)
↓ PHI 1 TIME CONSTANT FOR FE (FOA-FE)
↓ PHI 1 TIME CONSTANT FOR FE (FOB-FE)
↓ PHI 1 TIME CONSTANT FOR AV (FOA-AV)
↓ PHI 1 TIME CONSTANT FOR AV (FOB-AV)
↓ FORCED SLICING LEVEL FOR VERTICAL SYNC.(FSL)
↓ SYNCHRONISATION OF OSD/TEXT DISPLAY (HP2)
↓ RGB BLANK (RGBL)

FEATURE OPTION MODE

↓ V-CHIP (V-CHIP)
↓ MTS DECODING ENABLED (MTS)
↓ DEMO MODE (DEMO)
↓ REAL TIME CLOCK / ON TIMER (CLOCK)
↓ ENERGY SAVE (E-SAVE)
↓ PERSONAL PREFERENCE PROGRAM (P_PREF)
↓ UNIVERSAL PLUS (UNIV+)
↓ SPEAKER ON/OFF (SPEAKER)
↓ FIXED AUDIO OUT (FAO)
↓ VIEW TIMER (VIEW-TM)
↓ FRENCH LANGUAGE (FRENCH)
↓ EZ SETUP / AUTOPRESET (EZ-SETUP)
↓ WHITE TEMP OR FAVORITE COLOR (W-TEMP)
↓ AV ENABLED OR DISABLED (AV)
↓ AV2 ENABLED OR DISABLED (AV2)
↓ DYNAMIC SKIN CONTROL (DSK)
↓ RATIO PRE- AND OVERSHOOT BIT 0 (RPO0)
↓ RATIO PRE- AND OVERSHOOT BIT 1 (RPO1)
↓ GAIN FM DEMODULATOR (AGN)
↓ AUTO SWITCH OFF ENABLED (AUTO-OFF)

FORWARD : CH DOWN KEY
REVERSE : CH UP KEY
( ) means OSD display.

Figure B: ADJUSTMENT CATEGORIES

①Press the CH DOWN/UP key on the remote controller to get ready to select the mode one by one.
②Press the CH DOWN/UP key on the remote controller to select the modes reversibly one by one.
③Using the VOLUME UP/DOWN key on the remote controller, the data can be modified.
(OSD disturbance can be erased by R/C display key)

SERVICE MODE

SERVICE POSITION	ADJUST ITEM	DATA			REMARK
		RANGE	INITIAL VALUE	FIX/ADJ	
AGC	AGC TAKE OVER POINT	0 ~ 63	14	ADJ	
V-LIN	VERTICAL SLOPE	0 ~ 63	32	ADJ	
V-AMP	VERTICAL AMP	0 ~ 63	32	ADJ	
V-CENT	VERTICAL SHIFT	0 ~ 63	32	ADJ	
V-ZOOM	VERTICAL ZOOM	0 ~ 63	32	FIX	
H-CENT	HORIZONTAL SHIFT	0 ~ 63	32	ADJ	
H-SIZE	EAST-WEST WIDTH	0 ~ 63	32	FIX	
EW//	HORIZONTAL PARALLELOGRAM	0 ~ 63	32	FIX	
PARA	EAST-WEST PARABOLA / WIDTH	0 ~ 63	32	FIX	
COR(U)	EAST-WEST UPPER CORNER PARABOLA	0 ~ 63	32	FIX	
COR(L)	EAST-WEST LOWER CORNER PARABOLA	0 ~ 63	32	FIX	
TRAPE	EAST-WEST TRAPEZIUM	0 ~ 63	32	FIX	
HB	HORIZONTAL BOW	0 ~ 63	32	FIX	
S-COR	S-CORRECTION	0 ~ 63	0	FIX	Must be "17"
DRI-R-HI	W.P. RED OFFSET HIGH / OFFSET BLUE TONE	0 ~ 63	32	FIX	Must be "32"
DRI-G-HI	W.P. GREEN OFFSET HIGH / OFFSET BLUE TONE	0 ~ 63	32	FIX	Must be "33"
DRI-B-HI	W.P. BLUE OFFSET HIGH / OFFSET BLUE TONE	0 ~ 63	32	FIX	Must be "37"
DRI-R-MH	W.P. RED MH / STD	0 ~ 63	25	FIX	Must be "32"
DRI-G-MH	W.P. GREEN MH / STD	0 ~ 63	32	ADJ	
DRI-B-MH	W.P. BLUE MH / STD	0 ~ 63	32	ADJ	
DRI-R-ML	W.P. RED OFFSET ML / OFFSET RED TONE	0 ~ 63	32	FIX	Must be "32"
DRI-G-ML	W.P. GREEN OFFSET ML / OFFSET RED TONE	0 ~ 63	32	FIX	Must be "32"
DRI-B-ML	W.P. BLUE OFFSET ML / OFFSET RED TONE	0 ~ 63	32	FIX	Must be "25"
DRI-R-LO	W.P. RED OFFSET LOW	0 ~ 63	32	FIX	Must be "32"
DRI-G-LO	W.P. GREEN OFFSET LOW	0 ~ 63	32	FIX	Must be "22"
DRI-B-LO	W.P. BLUE OFFSET LOW	0 ~ 63	32	FIX	Must be "19"
SUB-VOL	MAX VOLUME	0 ~ 63	63	FIX	Must be "63"
SUB-CON	SUB CONTRAST	0 ~ 63	63	FIX	Must be "54"
SUB-COL	SUB COLOUR	0 ~ 63	32	ADJ	
SUB-BRI	SUB BRIGHTNESS	0 ~ 63	32	ADJ	
SUB-TINT	SUB TINT	0 ~ 63	32	ADJ	
SUB-SHP	SUB SHARPNESS	0 ~ 63	32	FIX	Must be "27"
HTL-VOL	MAX HOTEL VOLUME	0 ~ 63	32	FIX	
HTL-PRG	HOTEL PROGRAM NO	0~125 or >125 for none	255	FIX	
BB-CON	BLUE BACK CONTRAST	0 ~ 15	10	FIX	Must be "5"
RGB	OSD GRB REFERENCE	0 ~ 15	15	FIX	Must be "5"
CUT-R	BLACK LEVEL OFFSET R	0 ~ 63	32	ADJ	
CUT-G	BLACK LEVEL OFFSET G	0 ~ 63	32	ADJ	
CDL	CATHODE DRIVE LEVEL	0 ~ 15	0	FIX	Must be "4"
DL-TV	Y-D TIME (TV) [YD]	0 ~ 15	12	FIX	Must be "2"
DL-AV	Y-D TIME (AV) [YD]	0 ~ 15	12	FIX	Must be "8"
INIT	INITIAL/DEFAULT LANGUAGE	0(English), 1(Spanish), 2(French)	0	FIX	Must be "1"
FAO-VOL	FAO-MAX VOLUME	0 ~ 63	63	FIX	Must be "63"
ESV_OFFS	ENERGY SAVE OFFSET	0 ~ 63	10	FIX	Must be "20"
CCPOS	CLOSE CAPTION POSITION	0 ~ 255	32	ADJ	
ATT	ATTENUATE INPUT SIGNAL LEVEL	0 ~ 15	10	FIX*	
VCO	VCO FREE RUNNING FREQUENCY ADJ.	0 ~ 63	32	FIX*	
FILTER	STEREO, SAP, DBX FILTER ADJ.	0 ~ 63	28	FIX*	20LK32=FIX
WIDEBAND	STEREO SEPARATION ADJUSTMENT (300Hz)	0 ~ 63	32	FIX*	20LK62=ADJ
SPECTRAL	STEREO SEPARATION ADJUSTMENT (3kHz)	0 ~ 63	27	FIX*	
BASS	BASS LEVEL	0 ~ 15	8	FIX	
TREBLE	TREBLE LEVEL	0 ~ 15	8	FIX	
VSD	VERTICAL SCAN DISABLE	0 or 1 when item selected	0	FIX	
BKS	BLACK STRETCH	0(disable) or 1(enable)	1	FIX	
AVL	AUTOMATIC VOLUME LEVELLING	0(disable) or 1(enable)	1	FIX	
FFI	FAST FILTER IF-PLL	0(disable) or 1(enable)	0	FIX	
EVG	ENABLE VERTICAL GUARD	0(disable) or 1(enable)	1	FIX	
EHT	EHT TRACKING MODE	0(disable) or 1(enable)	1	FIX	
OSO	OVERSCAN SWITCH OFF	0(disable) or 1(enable)	0	FIX	
ACL	AUTO COLOUR LIMIT	0(disable) or 1(enable)	0	FIX	
FCO	FORCED COLOUR-ON	0(disable) or 1(enable)	0	FIX	
VMI	VIDEO MUTE AT IDENT LOSS	0(disable) or 1(enable)	1	FIX	
VMC	VIDEO MUTE AT PROGRAM/SOURCE CHANGE	0(disable) or 1(enable)	1	FIX	
HTL	HOTEL MODE	0(disable) or 1(enable)	0	FIX	
BTSC	GAIN FM DEMODULATOR	0(disable) or 1(enable)	0	FIX	
CP	CHARGE PUMP	0(fast tuning) or 1 (moderate speed tuning)	0	FIX	

Table - A

SERVICE POSITION	ADJUST ITEM	DATA			REMARK
		RANGE	INITIAL VALUE	FIX/ADJ	
FMWS	FM WINDOW SELECTION	0(disable) or 1(enable)	0	FIX	
SM0	SOUND MUTE BIT 0 (SM0)	0(disable) or 1(enable)	1	FIX	
SM1	SOUND MUTE BIT 1	0(disable) or 1(enable)	0	FIX	
AGC0	IF AGC SPEED BIT 0	0(disable) or 1(enable)	1	FIX	
AGC1	IF AGC SPEED BIT 1	0(disable) or 1(enable)	0	FIX	
FOA-FE	PHI 1 TIME CONSTANT FOR FE	0(disable) or 1(enable)	0	FIX	
FOB-FE	PHI 1 TIME CONSTANT FOR FE	0(disable) or 1(enable)	0	FIX	
FOA-AV	PHI 1 TIME CONSTANT FOR AV	0(disable) or 1(enable)	1	FIX	
FOB-AV	PHI 1 TIME CONSTANT FOR AV	0(disable) or 1(enable)	1	FIX	
FSL	FORCED SLICING LEVEL FOR VERTICAL SYNC.	0(disable) or 1(enable)	0	FIX	
HP2	SYNCHRONISATION OF OSD/TEXT DISPLAY	0(disable) or 1(enable)	0	FIX	
RGBL	RGB BLANK	0(disable) or 1(enable)	0	FIX	
V-CHIP	V-CHIP	0(disable) or 1(enable)	0	FIX	
MTS	MTS DECODING ENABLED	0(disable) or 1(enable)	0	FIX*	20LK32→0/20LK62→1
DEMO	DEMO MODE	0(disable) or 1(enable)	1	FIX	
CLOCK	REAL TIME CLOCK / ON TIMER	0(disable) or 1(enable)	1	FIX	Must be "1"
E-SAVE	ENERGY SAVE	0(disable) or 1(enable)	1	FIX	
P_PREF	PERSONAL PREFERENCE PROGRAM	0(disable) or 1(enable)	0	FIX	
UNIV+	UNIVERSAL PLUS	0(disable) or 1(enable)	0	FIX	
SPEAKER	SPEAKER ON/OFF	0(disable) or 1(enable)	0	FIX	
FAO	FIXED AUDIO OUT	0(disable) or 1(enable)	0	FIX	
VIEW-TM	VIEW TIMER	0(disable) or 1(enable)	1	FIX	Must be "1"
FRENCH	FRENCH LANGUAGE	0(disable) or 1(enable)	0	FIX	
EZ-SETUP	EZ SETUP / AUTOPRESET	0(AUTOPRESET) or 1(EZ SETUP)	1	FIX	
W-TEMP	WHITE TEMP OR FAVORITE COLOR	0(FC) or 1(WT)	0	FIX	
AV	AV ENABLED OR DISABLED	0(without ext. source) or 1(with external source)	0	FIX	
AV2	AV2 ENABLED OR DISABLED	0(1 input) or 1(2 input)	0	FIX*	20LK32→0/20LK62→1
DSK	DYNAMIC SKIN CONTROL	0(disable) or 1(enable)	0	FIX	
RPO0	RATIO PRE- AND OVERSHOOT BIT 0	0(disable) or 1(enable)	0	FIX	
RPO1	RATIO PRE- AND OVERSHOOT BIT 1	0(disable) or 1(enable)	0	FIX	
AGN	GAIN FM DEMODULATOR	0(normal) or 1(+6dB)	0	FIX	
AUTO-OFF	AUTO SWITCH OFF ENABLED	0(disable) or 1(enable)	1	FIX	
PON-CH	POWER ON WITH LOCAL PROGRAM KEYS	0(disable) or 1(enable)	0	FIX	

Table - A

Holding down to short JA137 & JA138 and turn on the main power SW will automatically write the initial values into IC1003.
This is only can done when a new EEPROM is used. (Judge with the first 4 bytes.)

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC801		X	Data is stored in IC1003.
IC1003	X		Holding down to short JA137 & JA138 and turn on the main power SW will automatically write the initial values into IC1003. This is only can done when a new EEPROM is used. (Judge with the first 4 bytes.)
CRT	X		Adjust items related to picture tube only.

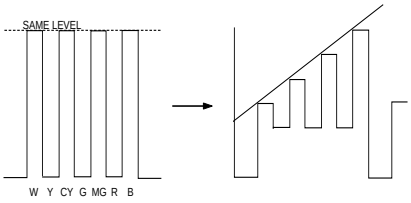
Table - B

■ SERVICE ADJUSTMENT

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "AGC".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

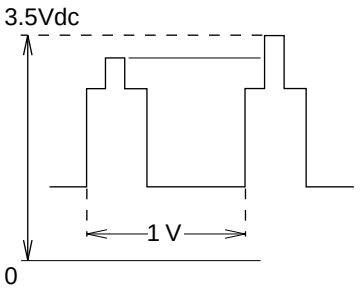
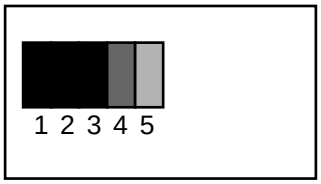
CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB-TINT (I^2C BUS CONTROL)**	1. Receive the "Colour Bar" signal through AV in. 2. Connect the oscilloscope to TP853 (Pin (5) of P882) BLUE-OUT. ● Range : 100mV/div. (AC)(Use Probe 10:1) ● Sweep time : 10 µsec/div. 3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as Fig 1. 4. "SUB-TINT" bus data decrease 4 steps to get final waveform. (Fig 2.) 5. Clear the SERVICE mode.	WAVEFORM 1 / FINAL WAVEFORM  Fig 1 Fig 2

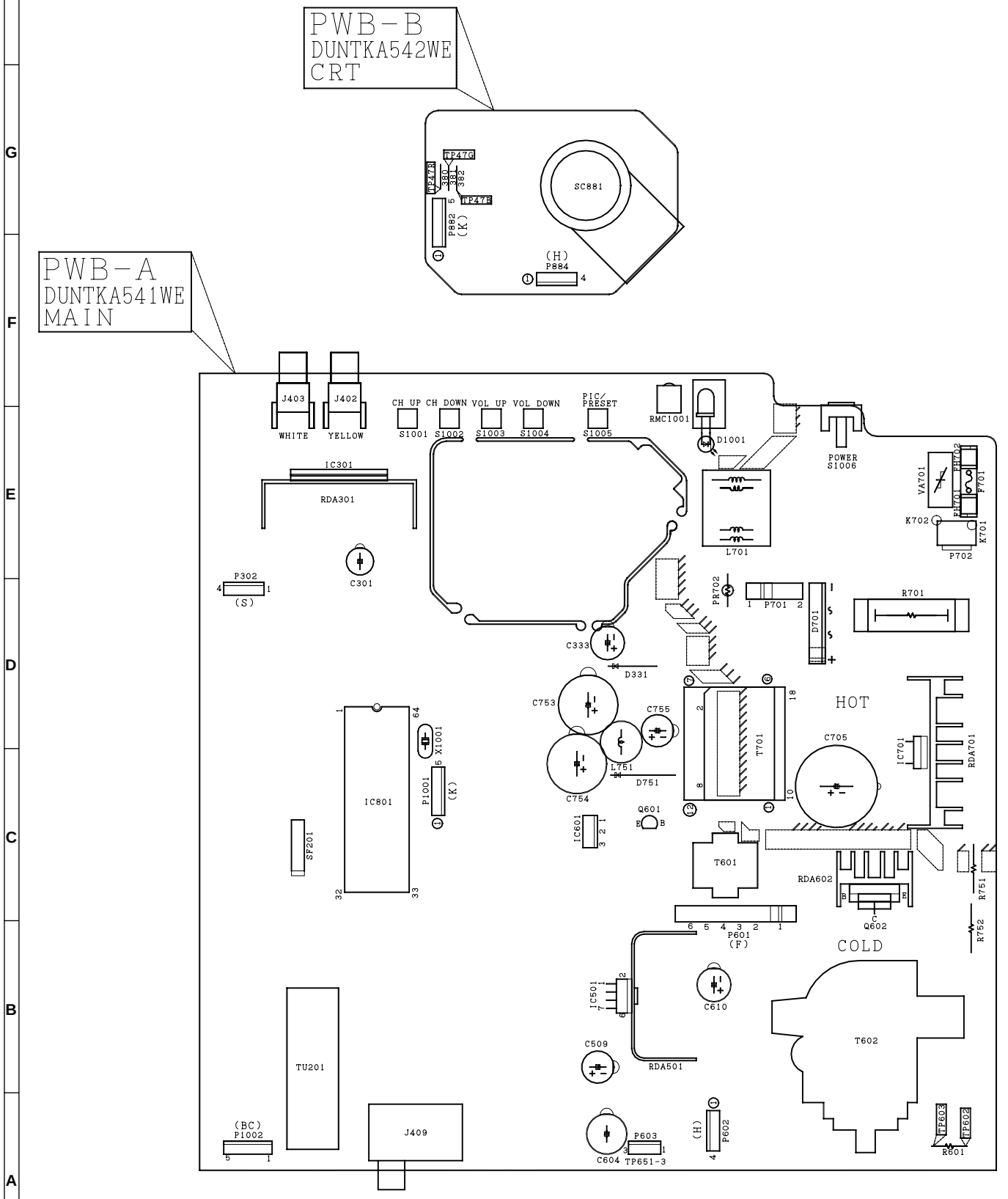
HORIZONTAL AND VERTICAL DEFLECTION LOOP ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**V-SLOPE(I^2C BUS CONTROL)**	1. Receive the "Monoscope Pattern" signal. 2. Call the "V-LIN" mode. 3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.	
2	**V-CENTER (I^2C BUS CONTROL)**	1. Call the "V-CENT" mode. 2. Increase or decrease "V-CENT" by Volume key till the picture is centered.	
3	**V - AMP (I^2C BUS CONTROL)**	1. Call the "V-AMP" mode. 2. Increase or decrease "V - AMP" by Volume key to set overscan of 10.0% typical. Adjustment Spec 10.0% range ±1%.	
4	**S-CORRECTION (I^2C BUS CONTROL)**	**FIXED DATA, NO NEED TO ADJUST.**	
5	**H - CENTER**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
6	**Focus adjustment**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focus.	

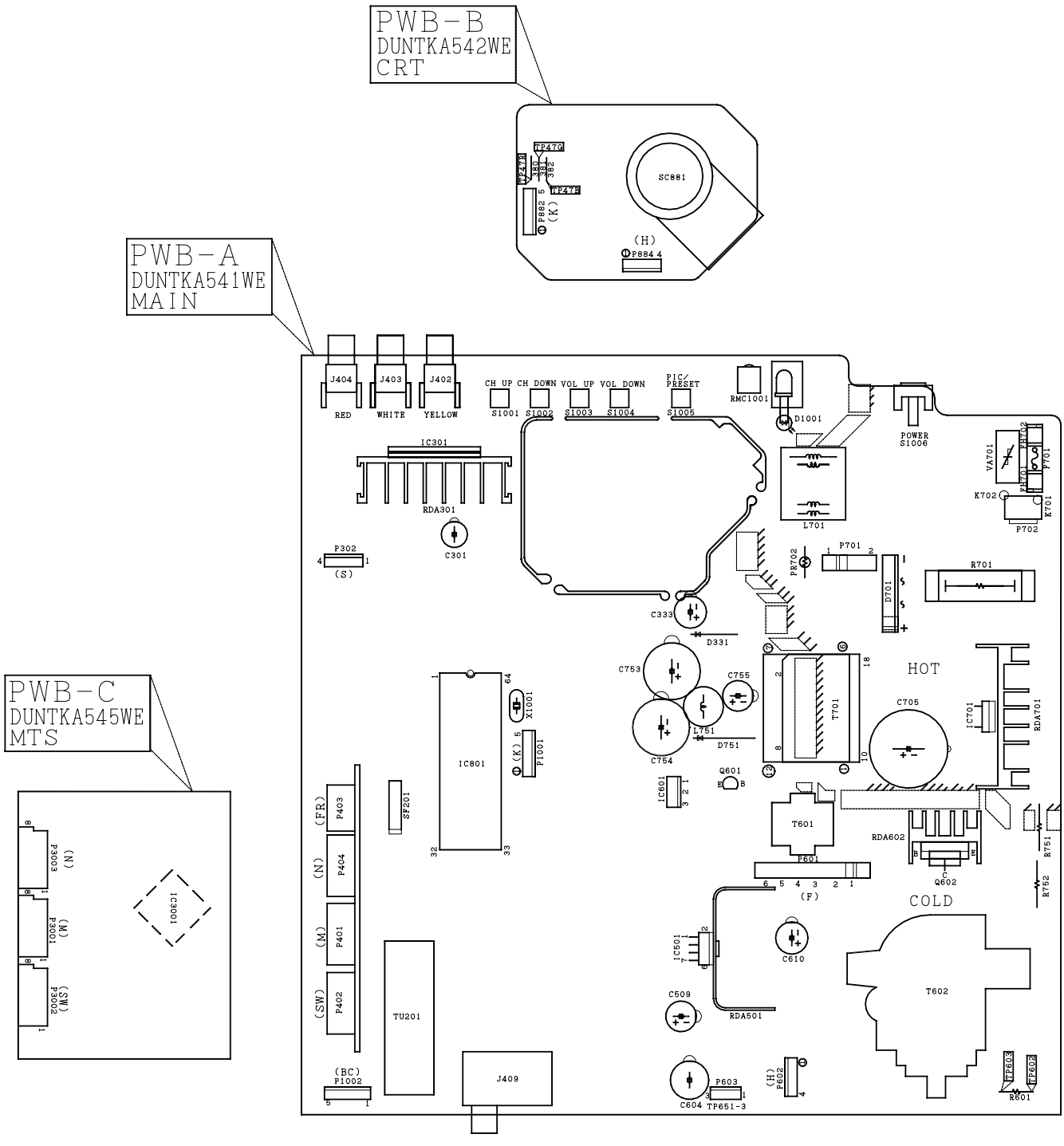
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I^2C BUS CONTROL)**	1. Switch TV to VIDEO mode, BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red OUT from IC801.(TP47R) Range : 1 V/Div (DC) Sweep : 5 msec/Div 4. Adjust SCREEN VR ,so that the tip of signal reach 3.5 Vdc + 0.1 Vdc.	
2	**SUB-BRIGHT-NESS ADJUSMENT (I^2C BUS CONTROL)**	1. Call "SUB-BRI" in service mode. (Receive Cross-hatch pattern with 5 black level windows) 2. Adjust the "SUB BRIGHT" bus data in order that the line 1, 2 and 3 have the same darkness wherelse line 4 is slightly brighter than line 1, 2 and 3 and finally line 5 will be the brighter than line 4.	 1, 2, 3 are in same black level.
3	**WHITE BAL-ANCE SERV-ICE MODE ADJ. (I2C BUS CONTROL)**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between the TP 602 (-) TP 603 (+). 4. Check Beam current should be around (990µA) 5. Set it to service mode and adjust the DRI-G-MH, & DRI-B-MH data to have a colour temperature of 11,600°K (white). 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to ** 10 cd/m2 (MINOLTA CA-100) by reducing LUMINATE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get 11,600°K. Then go back NORMAL mode (HIGH BRIGHT**) to check colour temperature. If out of range, back to (1). **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 500µA.** DRI-R-MH=32 (FIXED) DRI-G-MH=33 (FIXED) DRI-B-MH=37 (FIXED) DRI-R-MH=32 (FIXED)	# 11,600° K X : 0.273 Y : 0.280 (MINOLTA COLOUR ANALYZER CA-100) *NOTE: Above DATA can be UP/ DOWN by volume key. LOW HIGH 20" 1.8cd/m^2 115cd/m^2 * 11,600° K DRI-GW="DRI-GS"DATA-5 DRI-BW="DRI-BS" DATA-5
4	**Maximum beam check**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP603 (+) and TP602 (–). (Full Scale: 3 mA Range) 4. Beam current must be within 990 ± 50 µA.	

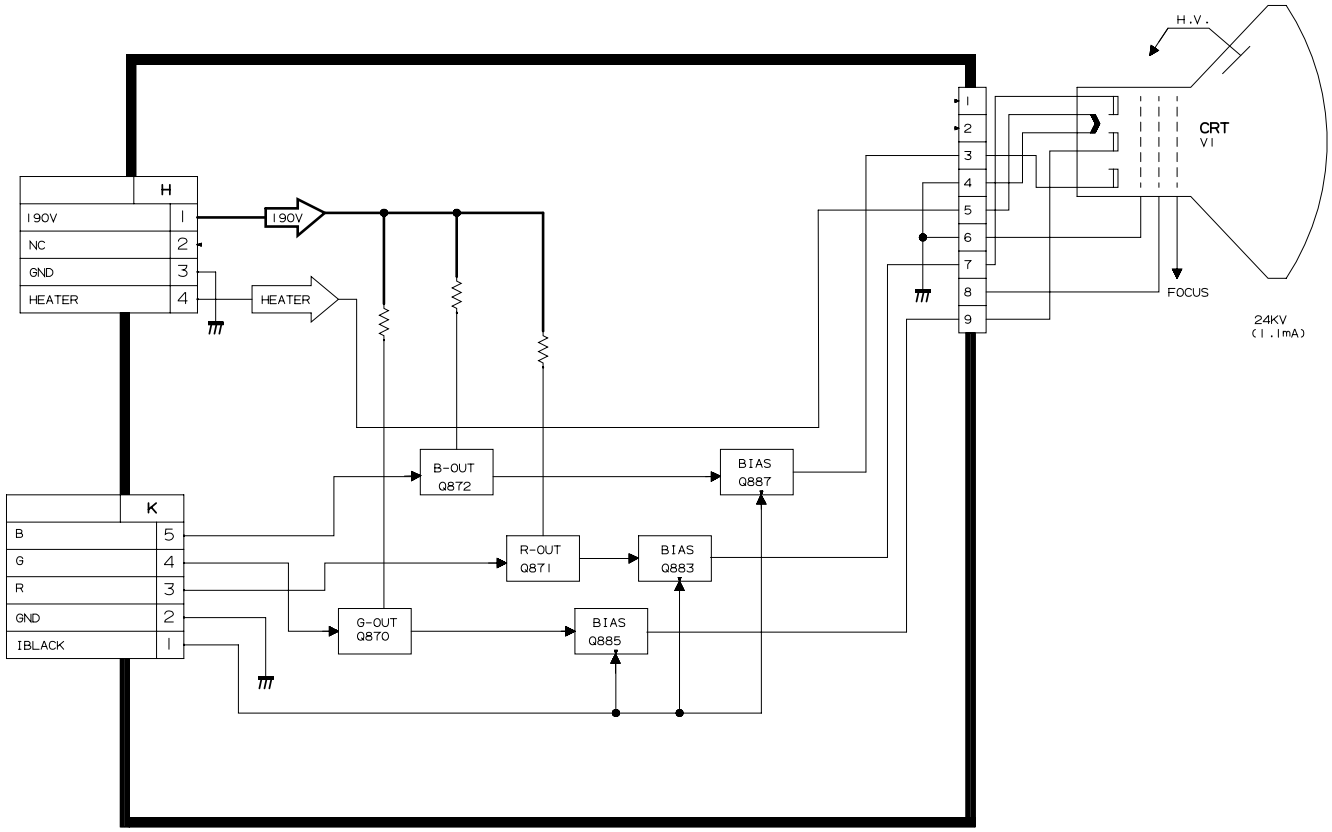
MODEL 20LK32 CHASSIS LAYOUT



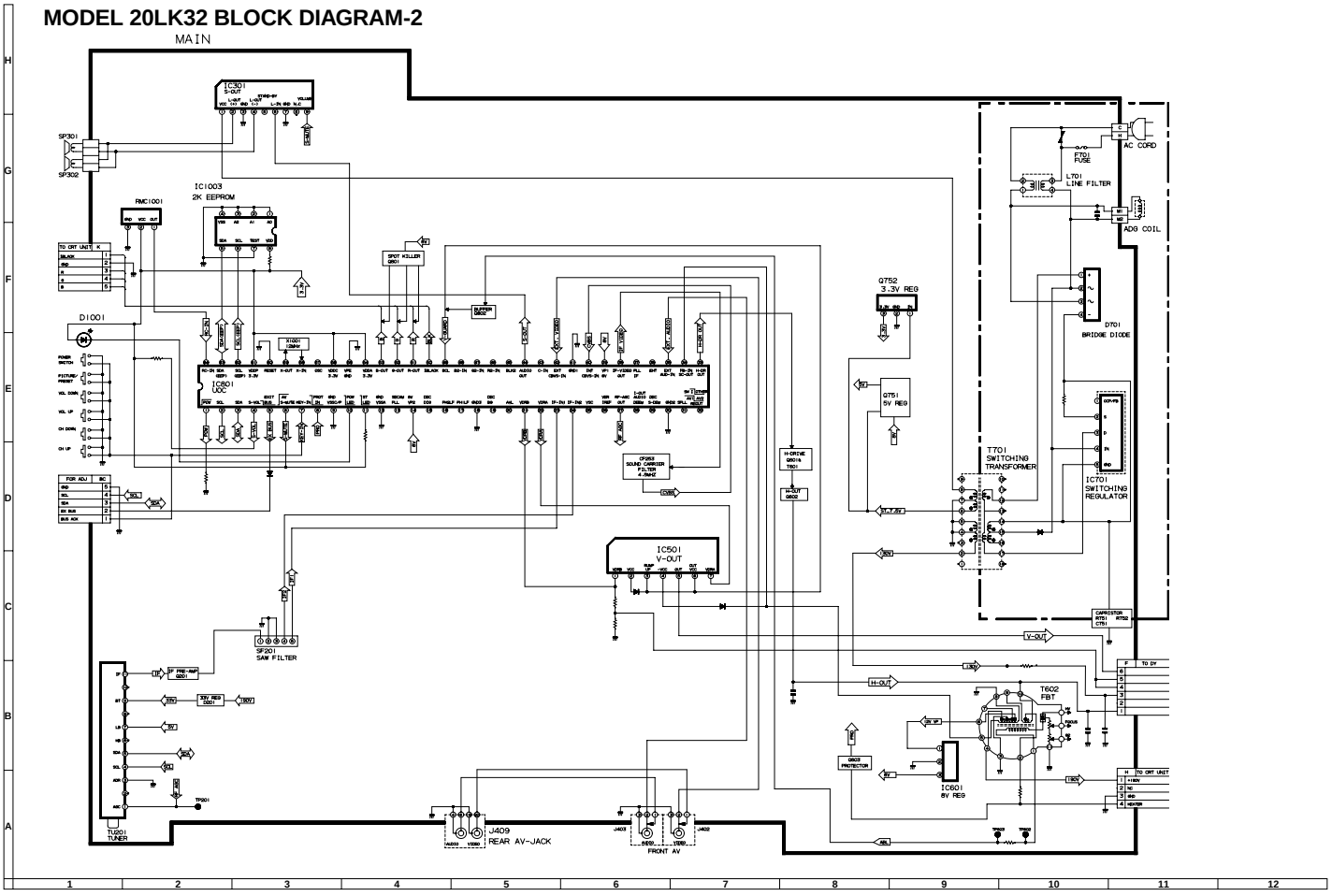
MODEL 20LK62 CHASSIS LAYOUT



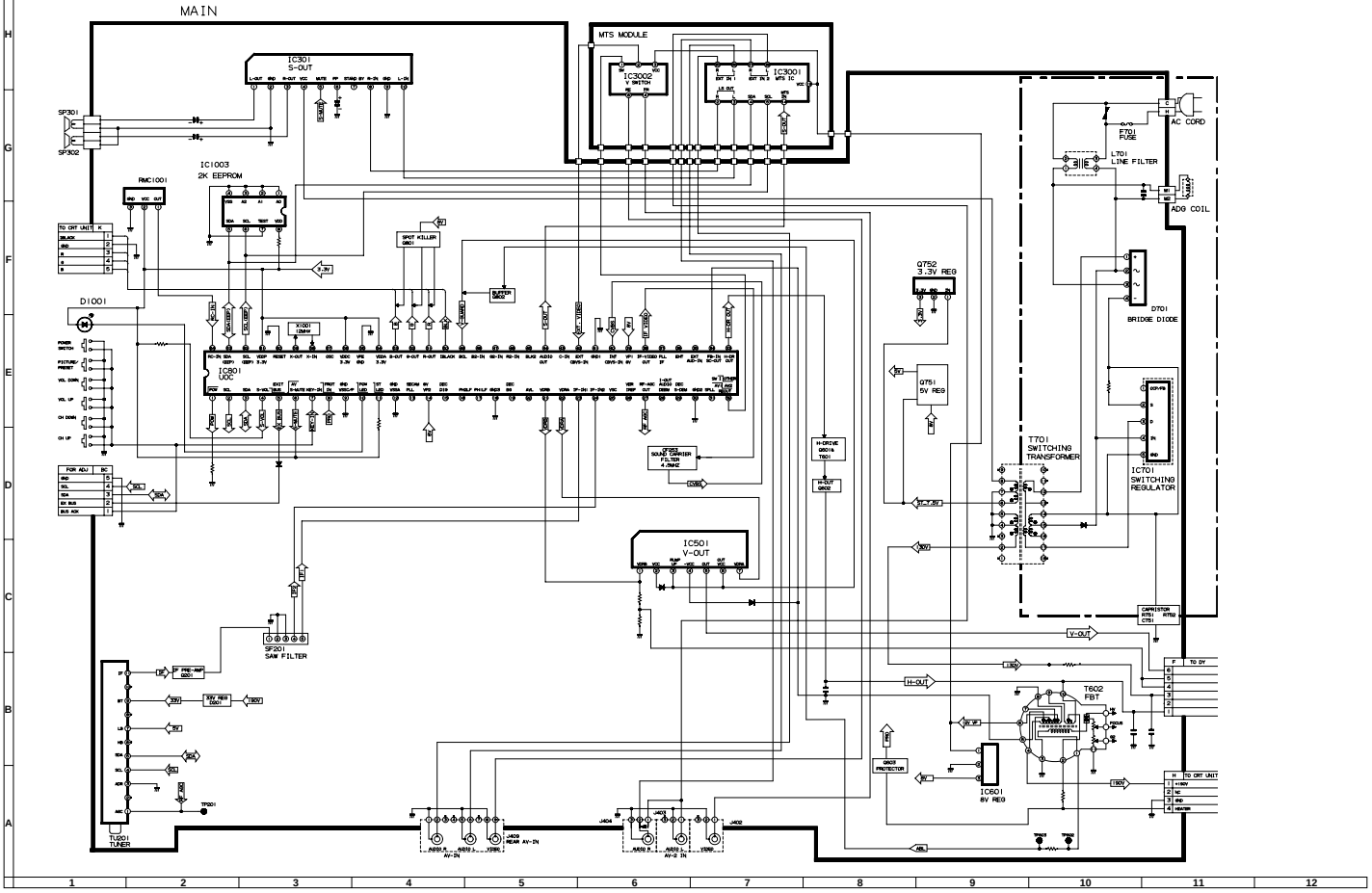
BLOCK DIAGRAM-1



MODEL 20LK32 BLOCK DIAGRAM-2



MODEL 20LK62 BLOCK DIAGRAM-2



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:

1. *The unit of resistance "ohm" is omitted. (K=kΩ=1000Ω, M=MΩ)*
2. *All resistors are 1/16 watt, unless otherwise noted.*
3. *All capacitors are μ F, unless otherwise noted. (P=pF=μμF)*
4. *(G) indicates ±2% tolerance may be used.*
5. *⏚ indicates line isolated ground.*
6. *⏚ indicates hot ground.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.*
2. *All voltages measured with 1000μ V B & W or Color signal.*

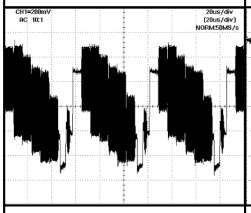
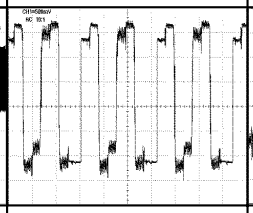
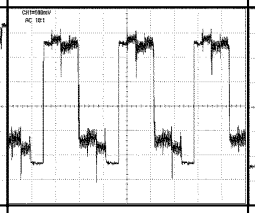
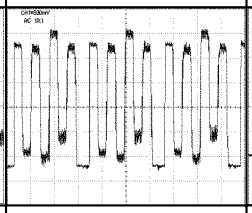
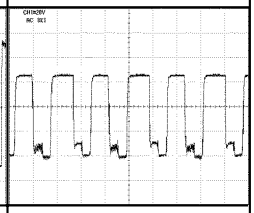
WAVEFORM MEASUREMENT CONDITIONS:

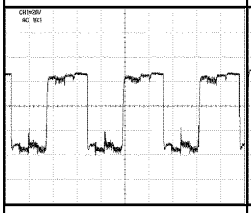
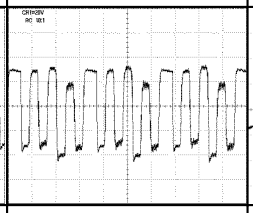
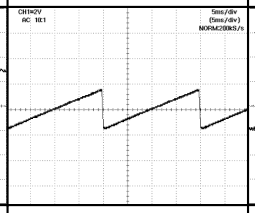
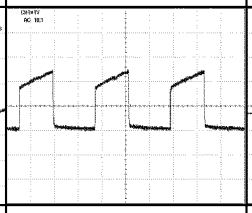
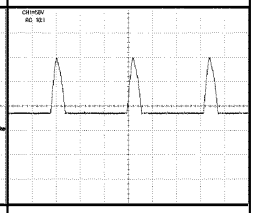
1. *Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.*
2. *◯► indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)*

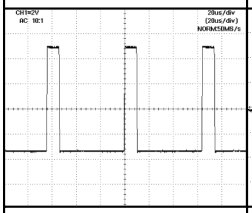
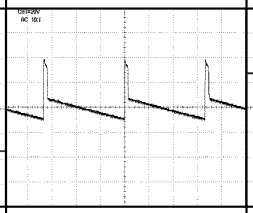
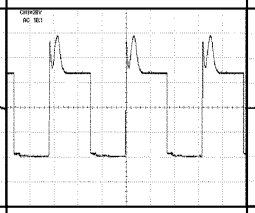
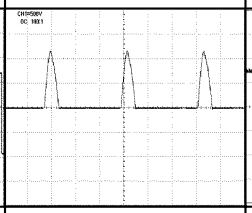
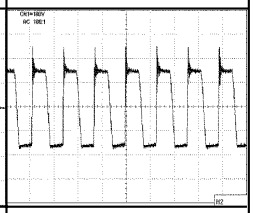
⚠ AND SHADED ( ) COMPONENTS = SAFETY RELATED PARTS.
▲ MARK= X-RAY RELATED PARTS.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

WAVEFORMS

① 1.0 Vp-p	② 2.8 Vp-p	③ 2.6 Vp-p	④ 2.7 Vp-p	⑤ 65.0 Vp-p
				
Horiz. Rate	Horiz. Rate	Horiz. Rate	Horiz. Rate	Horiz. Rate

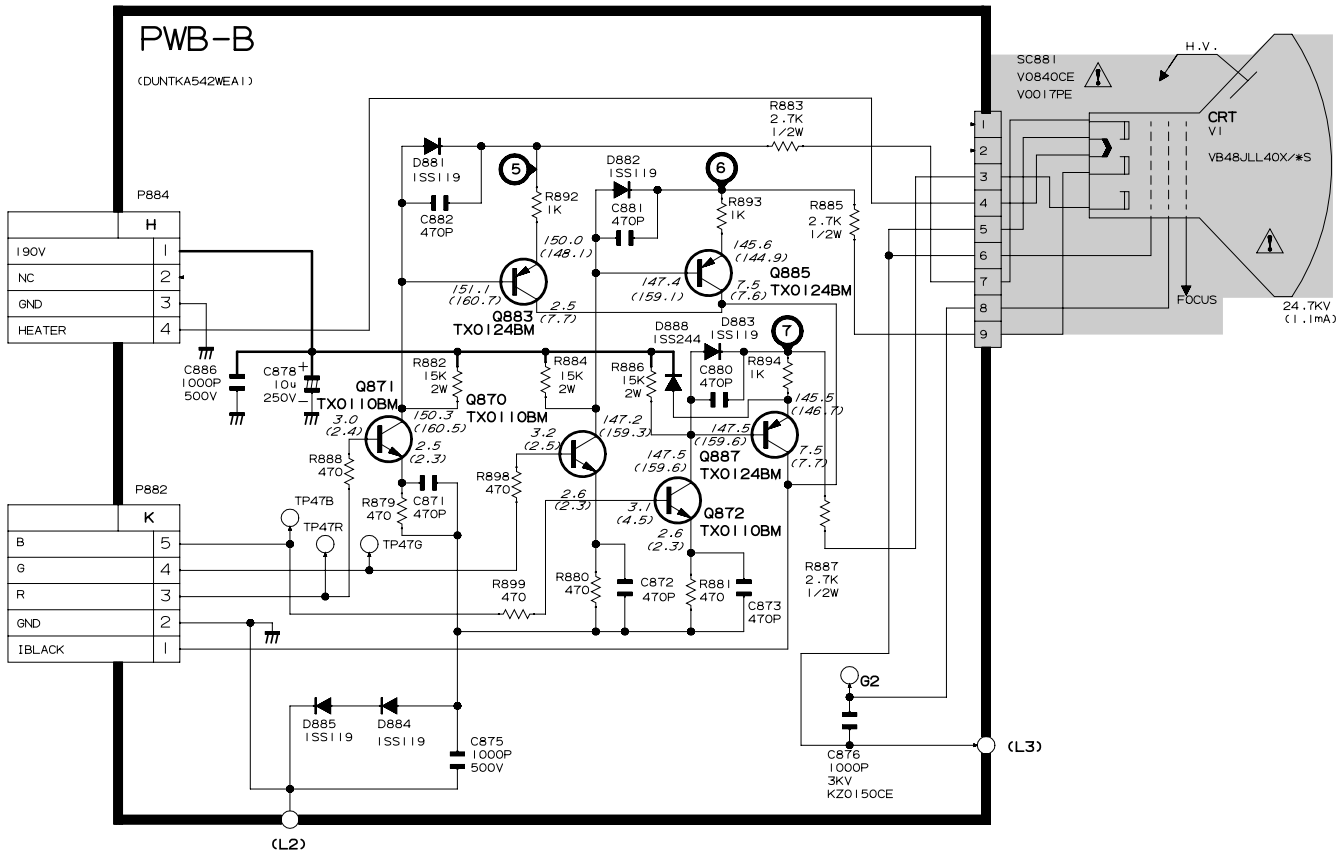
⑥ 67.0 Vp-p	⑦ 80.0 Vp-p	⑧ 3.0 Vp-p	⑨ 2.3 Vp-p	⑩ 116.0 Vp-p
				
Horiz. Rate	Horiz. Rate	Vert. Rate	Horiz. Rate	Horiz. Rate

⑪ 8.4 Vp-p	⑫ 40.8 Vp-p	⑬ 98.0 Vp-p	⑭ 1,160 Vp-p	⑮ 415.0 Vp-p
				
Horiz. Rate	Vert. Rate	Horiz. Rate	Horiz. Rate	Power Supply Rate

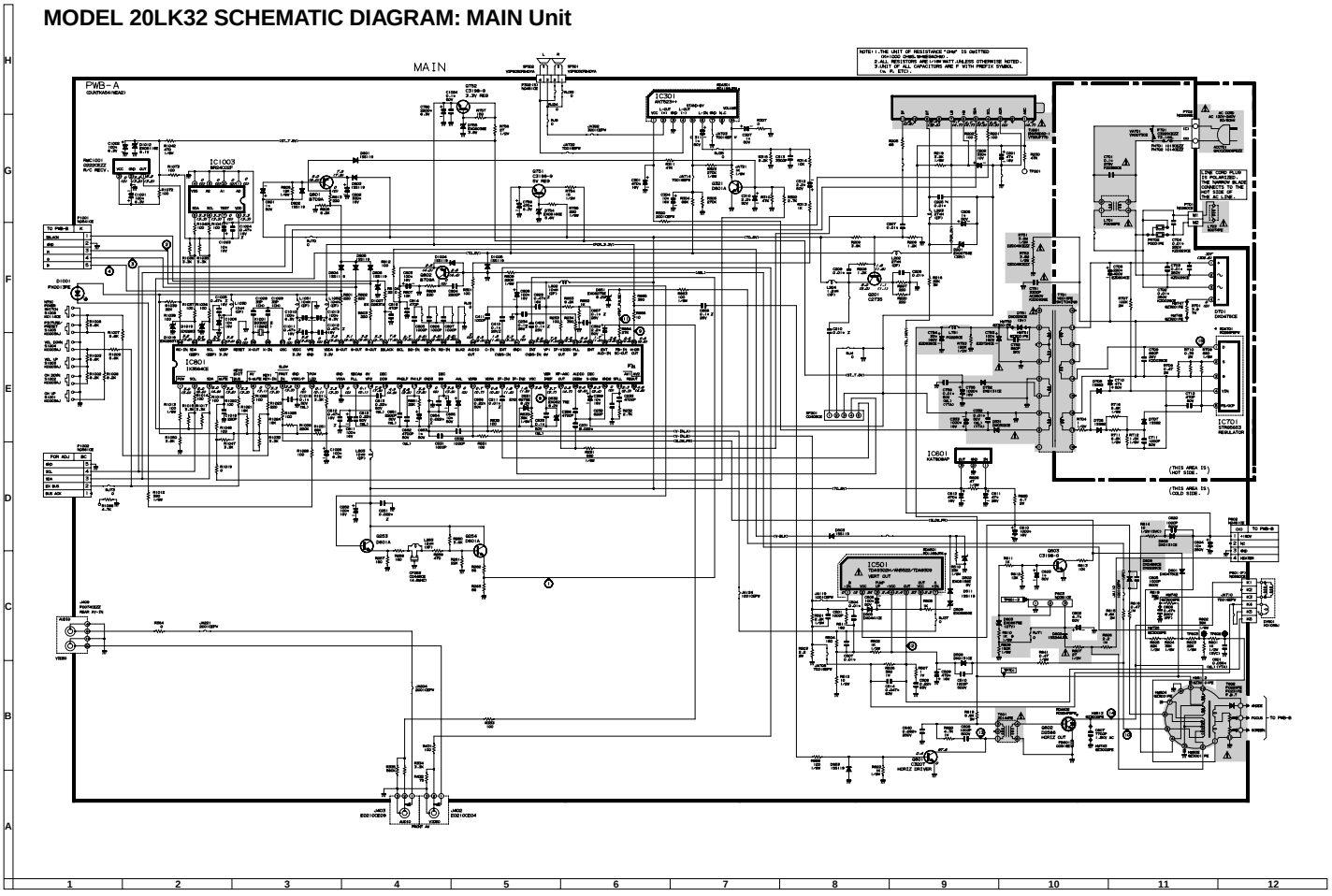
SCHEMATIC DIAGRAM: CRT Unit

NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS, M=MEGAOHM).
2.ALL RESISTORS ARE 1/16 WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u, P, ETC).

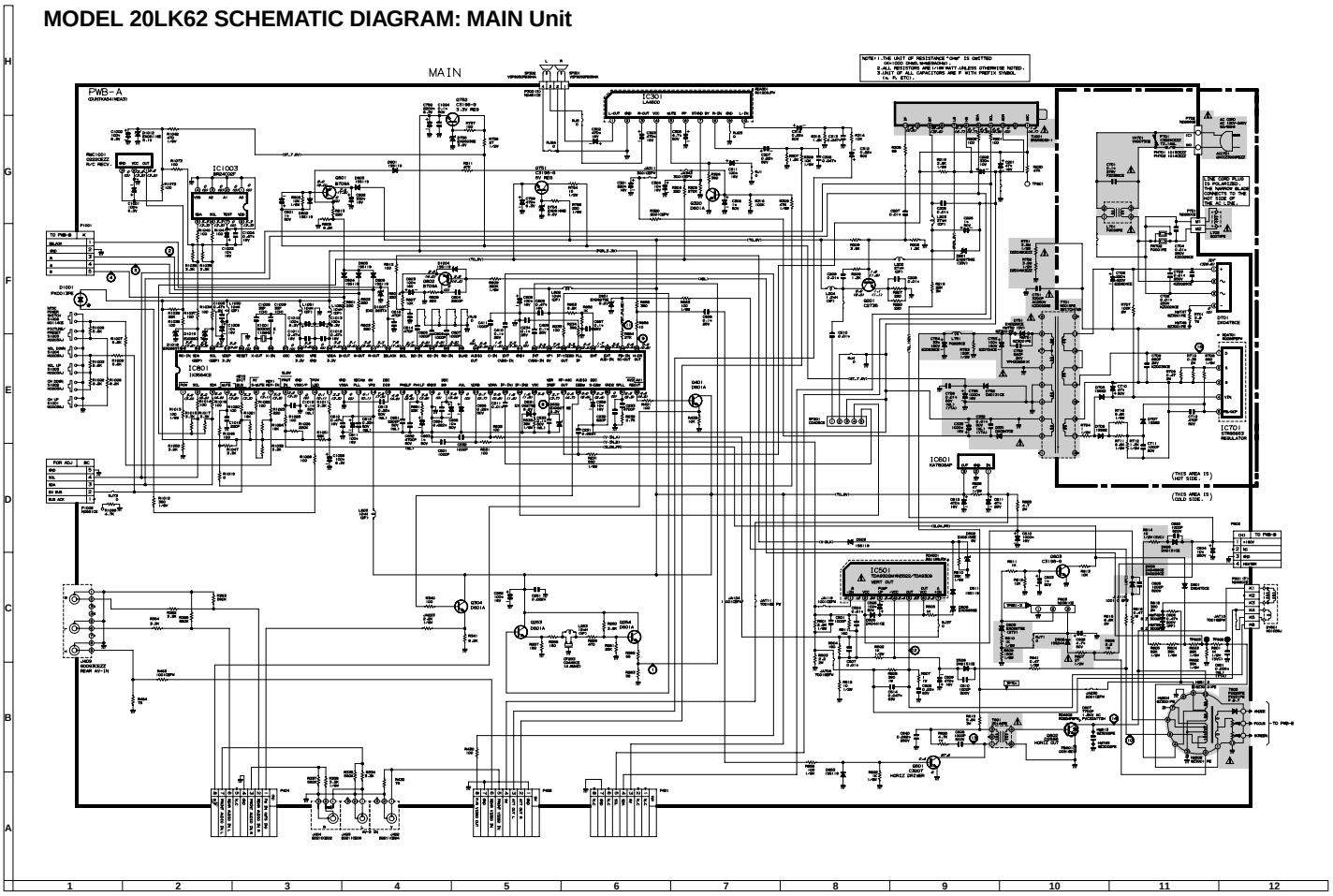
CRT



MODEL 20LK32 SCHEMATIC DIAGRAM: MAIN Unit

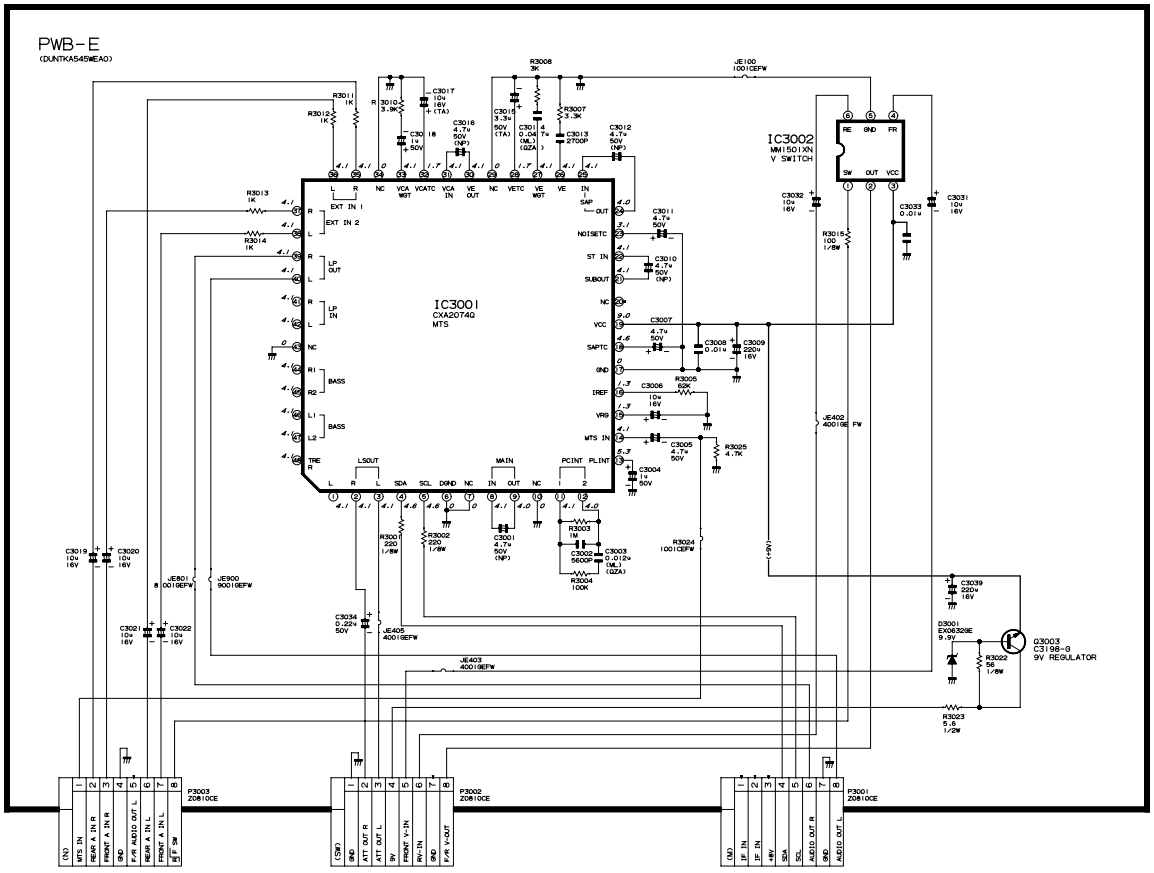


MODEL 20LK62 SCHEMATIC DIAGRAM: MAIN Unit

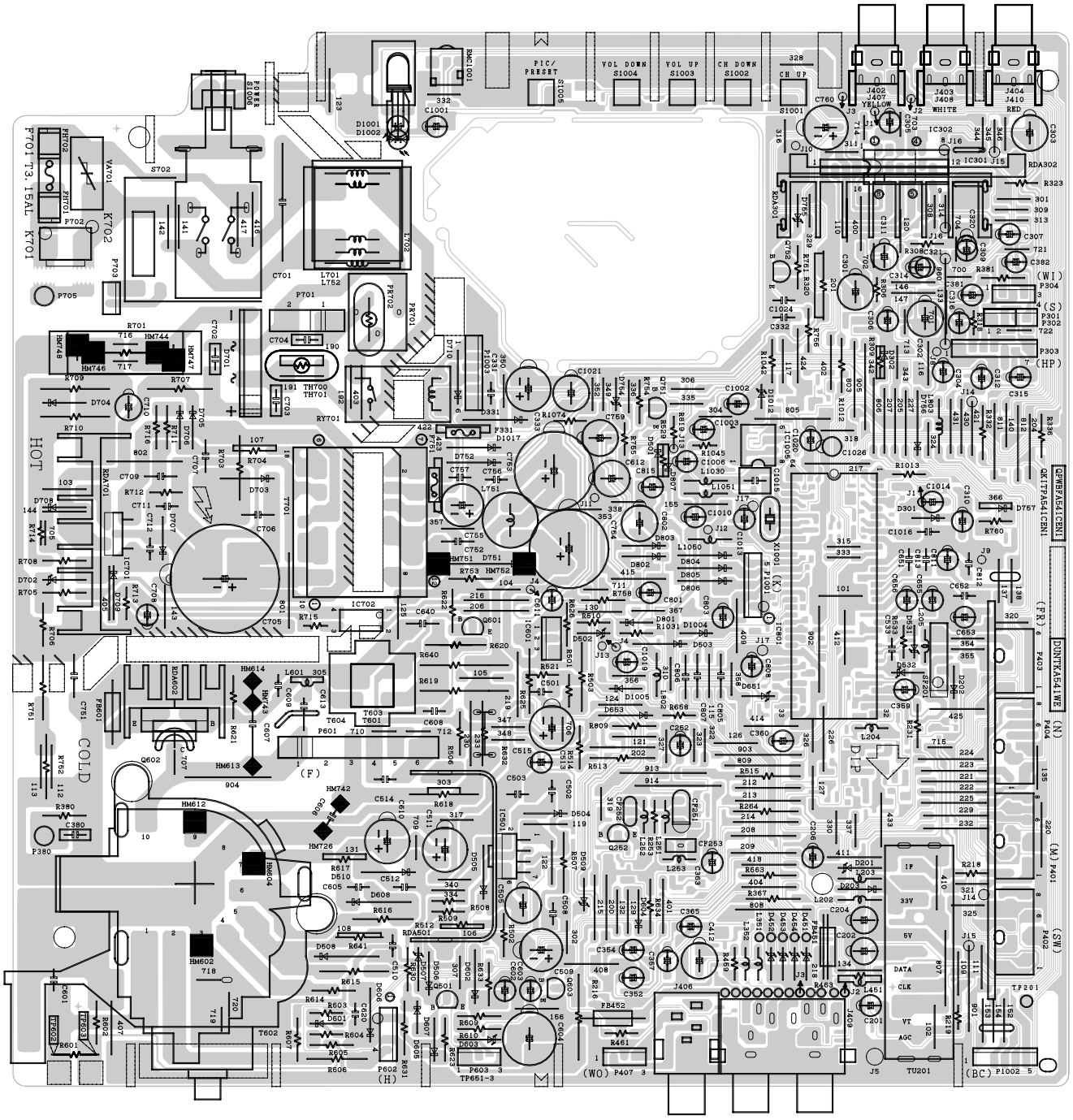


MODEL 20LK62 SCHEMATIC DIAGRAM: MTS MODULE Unit

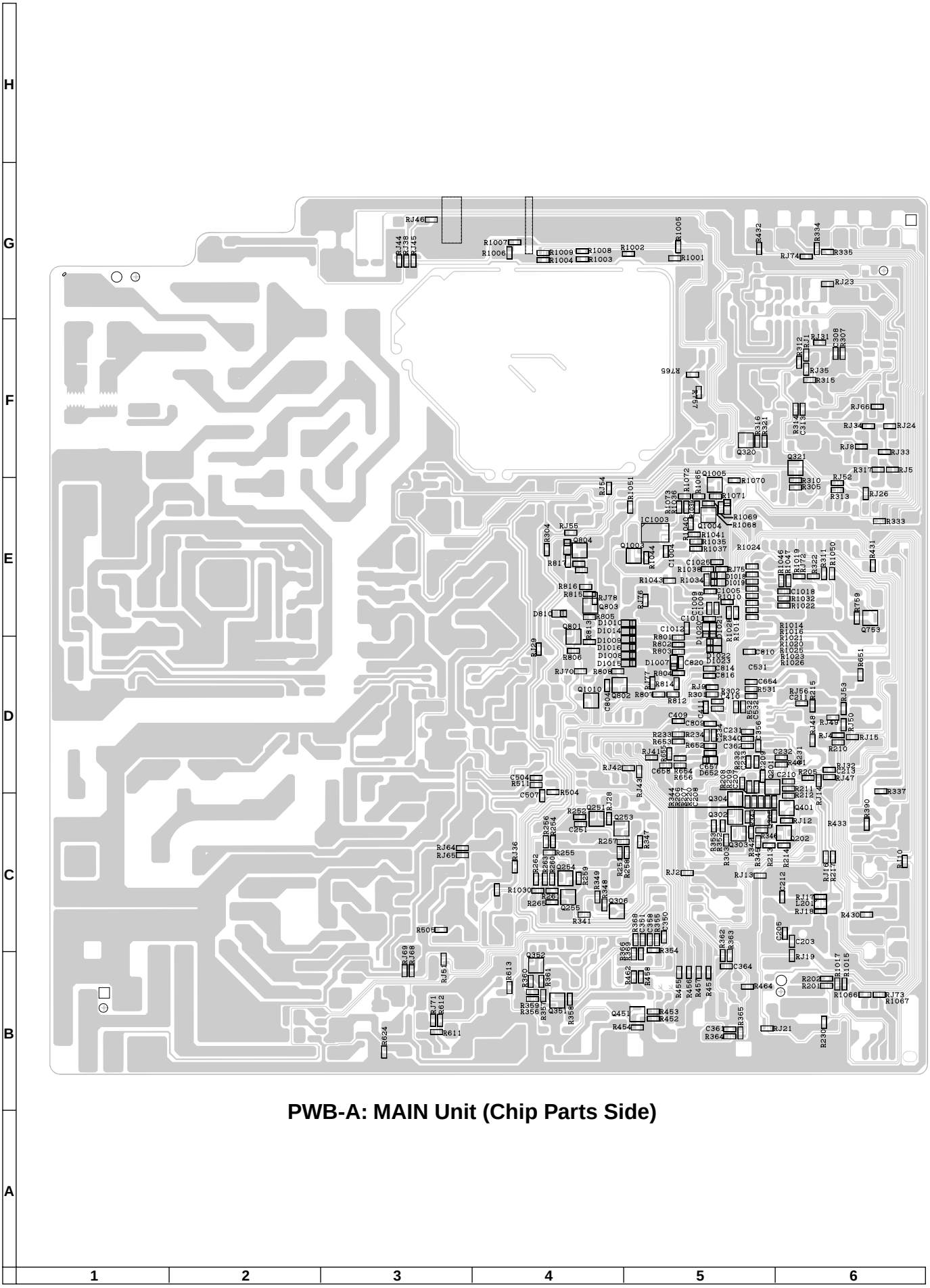
MTS MODULE



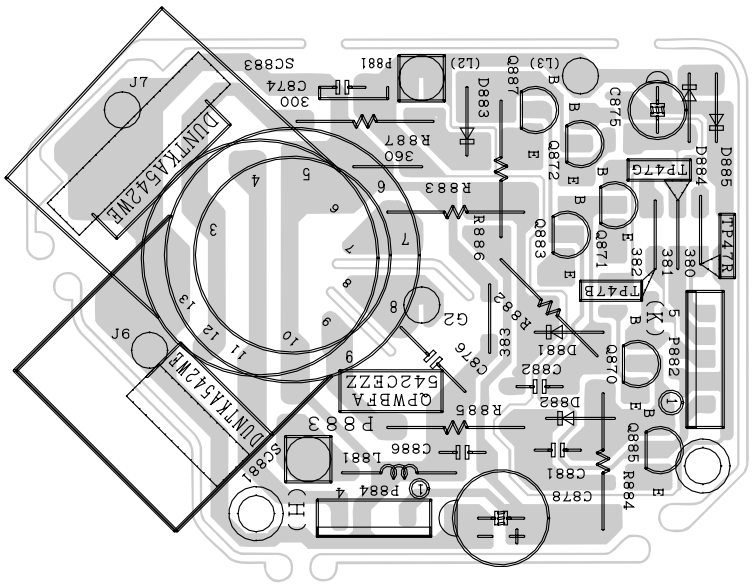
PRINTED WIRING BOARD ASSEMBLIES



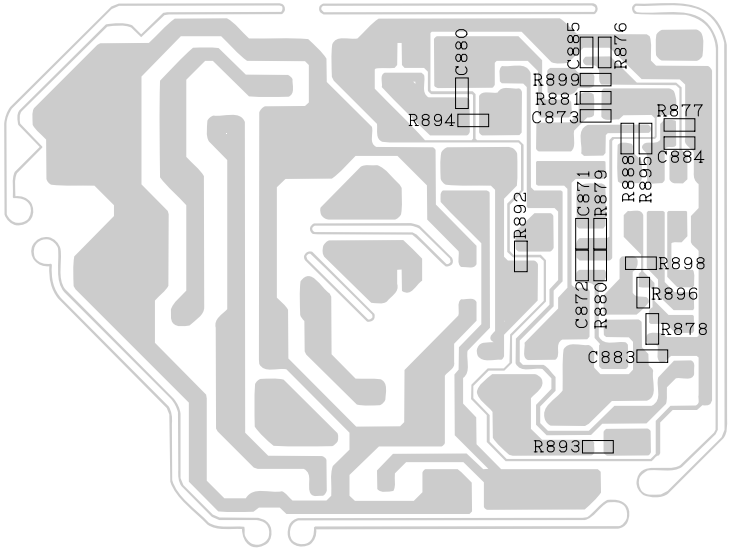
PWB-A: MAIN Unit (Wiring Side)



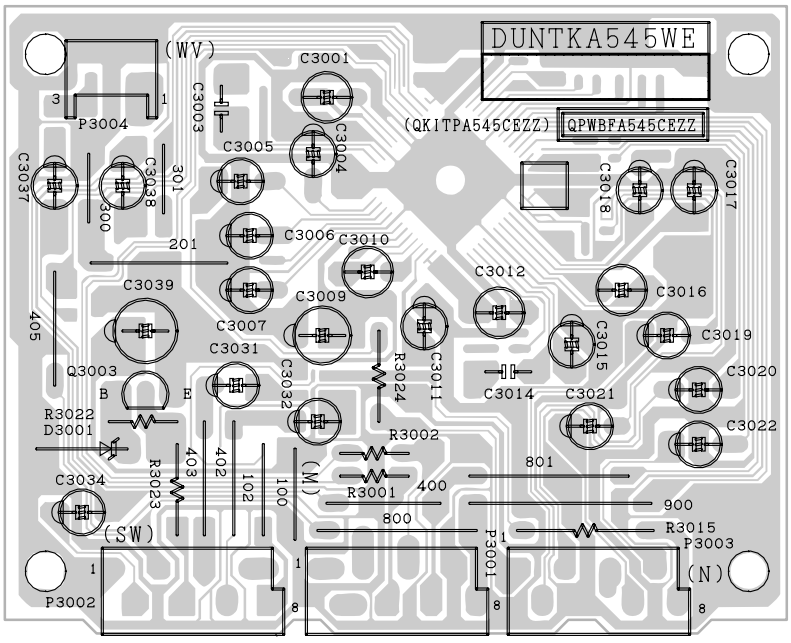
PWB-A: MAIN Unit (Chip Parts Side)



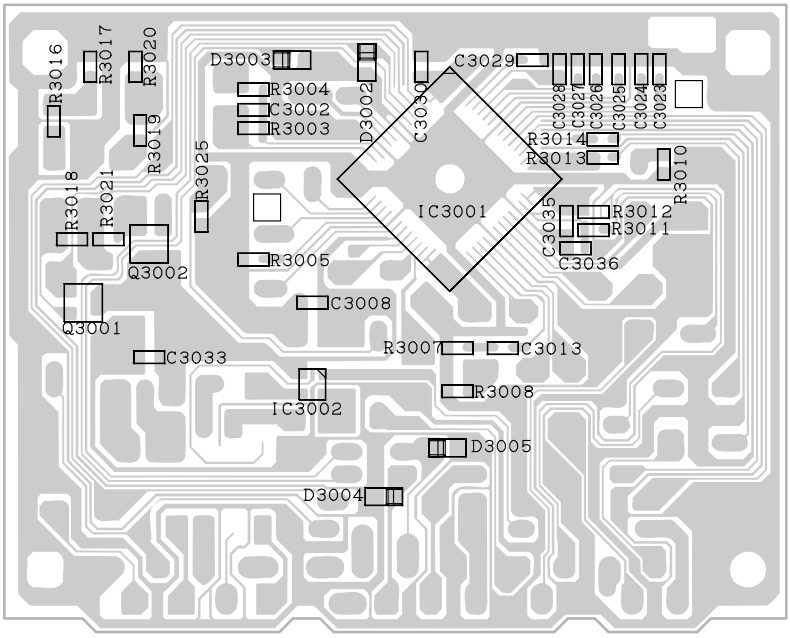
PWB-B: CRT Unit (Wiring Side)



PWB-B: CRT Unit (Chip Parts Side)



PWB-E: MTS MODULE Unit (Wiring Side)
(Only for 20LK62)



PWB-E: MTS MODULE Unit (Chip Parts Side)
(Only for 20LK62)

PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does no have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

★MARK: SPARE PARTS-DELIVERY SECTION

▲ MARK : X- RAY RELATED PARTS

Ref. No.	Part No.	★	Description	Code

PICTURE TUBE

⚠ V1	VB48JLL40X/∗S	X	Picture Tube	BY
⚠ L703	RCiLG0074PEZZ	R	Degaussing Coil	AQ
⚠ DY601	RCiLH0105GJZZ	X	Deflection Yoke	AX
	LHLDW0102GJKZ	X	Wire Holder, x5	AC
	PMAGF3045CEZZ	J	Purity Magnet	AG
	QEARC2016PEZZ	R	Grounding Strap	AG
	PSPAG0012MEZZ	X	Wedge, x3	AE
	MSPRC0005PEFW	J	Spring for CRT	AB

PRINTED WIRING BOARD ASSEMBLIES
(NOT REPLACEMENT ITEM)

PWB-A DUNTKA541WEA2	–	MAIN Unit (20LK32)	—
PWB-A DUNTKA541WEA3	–	MAIN Unit (20LK62)	—
PWB-B DUNTKA542WEA1	–	CRT Unit	—
PWB-E DUNTKA545WEA0	–	MTS MODULE Unit (20LK62)	—

Ref. No.	Part No.	★	Description	Code

PWB-A: DUNTK541WEA2 (20LK32)
PWB-A: DUNTK541WEA3 (20LK62)
MAIN UNIT

TUNER

NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.

⚠	TU201	VTUENV56D82-1 or VTUVTSTSUF770	J	Tuner	AZ

INTEGRATED CIRCUITS

	IC301	VHiAN7523++-1	X	AN7523++ (20LK32)	AK
	IC301	VHiLA4600++-1	X	LA4600(20LK62)	AM
⚠	IC501	VHiTDA9302H-1 or VHiAN5522++1	X	TDA9302H	AK
	IC601	VHiKA7808AP-1	J	KA7808API	AE
⚠	IC701	VHiSTRG5653-1	X	STRG5653	AQ
	IC801	RH-iX3564CEN1	X	IX3564CE	AX
	IC1003	VHiBR24C02F1E	J	BR24C02F-W	AF

TRANSISTORS

	Q201	VS2SC2735//1E	J	2SC2735	AC
	Q253	VS2SD601A//-1	J	2SD601A	AC
	Q254	VS2SD601A//-1	J	2SD601A	AC
	Q304	VS2SD601A//-1	J	2SD601A (20LK62)	AC
	Q320	VS2SD601A//-1	J	2SD601A (20LK62)	AC
	Q321	VS2SD601A//-1	J	2SD601A (20LK32)	AC
	Q401	VS2SD601A//-1	J	2SD601A (20LK62)	AC
	Q601	VS2SC3207//-1	J	2SC3207	AC
	Q602	VS2SD2586//1E	J	2SD2586	AM
	Q603	VS2SC3198-G-1	J	2SC3198-G	AA
	Q751	VS2SC3198-G-1	J	2SC3198-G	AA
	Q752	VS2SC3198-G-1	J	2SC3198-G	AA
	Q801	VS2SB709A//-1	J	2SB709A	AA
	Q802	VS2SB709A//-1	J	2SB709A	AA

DIODES

	D201	RH-EX0676GEZZ	J	Zener Diode, 33V	AA
⚠	D331	RH-DX0302CEZZ	J	Diode (20LK32)	AC
⚠	D331	RH-DX0247CEZZ	J	Diode (20LK62)	AE
	D502	RH-EX0615GEZZ	J	Zener Diode, 5V	AA
	D503	VHD1SS119//-1	J	Diode	AB
	D505	RH-DX0441CEZZ	J	Diode	AC
	D508	RH-DX0131CEZZ	J	Diode	AC
	D509	RH-EX0665GEZZ	J	Zener Diode	AA
	D511	VHD1SS119//-1	J	Diode	AB
	D531	RH-EX0627GEZZ	J	Zener Diode, 8.2V	AA
	D532	RH-EX0627GEZZ	J	Zener Diode, 8.2V	AA
	D601	RH-DX0475CEZZ	J	Diode	AB
⚠	D602	VHD1SS244//-1	J	Diode	AB
⚠	D603	RH-EX0667GEZZ	J	Zener Diode, 27V	AA
⚠	D606	RH-DX0131CEZZ	J	Diode	AC
⚠	D608	RH-DX0468CEZZ or RH-DX0229CEZZ	J	Diode	AE
	D651	RH-EX0627GEZZ	J	Zener Diode, 8.2V	AA
	D653	VHD1SS119//-1	J	Diode	AB
	D701	RH-DX0476CEZZ	J	Diode	AG
	D705	VHD1SS82///1A	J	Diode	AC
	D706	VHD1SS82///1A	J	Diode	AC
	D707	VHD1SS82///1A	J	Diode	AC
⚠	D751	RH-DX0229CEZZ	J	Diode	AF
⚠	D752	RH-DX0131CEZZ	J	Diode	AC
	D754	RH-EX0616GEZZ	J	Zener Diode, 5.6V	AA
	D755	RH-EX0603GEZZ	J	Zener Diode, 3.9V	AA
	D801	VHD1SS119//-1	J	Diode	AB
	D802	VHD1SS119//-1	J	Diode	AB
	D803	VHD1SS119//-1	J	Diode	AB
	D804	VHD1SS119//-1	J	Diode	AB
	D805	VHD1SS119//-1	J	Diode	AB
	D806	VHD1SS119//-1	J	Diode	AB
	D1001	RH-PX0013PEZZ	R	LED, ON TIMER	AC
	D1004	VHD1SS119//-1	J	Diode	AB

PWB-A: DUNTK541WEA2 (20LK32)
PWB-A: DUNTK541WEA3 (20LK62)
MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
D1007	RH-EX0263TAZZ	J	Zener Diode	AB
D1012	RH-EX0611GEZZ	J	Zener Diode	AA
D1018	RH-EX0263TAZZ	J	Zener Diode	AB
D1019	RH-EX0263TAZZ	J	Zener Diode	AB
⚠ VA701	RH-VX0073CEZZ	X	Varistor	AF

PACKAGED CIRCUITS

PR702	RMPTP0001PEZZ	R	Packaged Circuit	AN
X1001	RCRSB0300CEZZ	J	Crystal	AF

FILTERS AND COILS

CF253	RFiLC0446CEZZ	J	Ceramic Filter	AD
L202	VP-DF270K0000	J	Peaking 27µH	AB
L203	VP-DF270K0000	J	Peaking 27µH	AB
L204	VP-XF1R2K0000	J	Peaking 1.2µH	AB
L253	VP-XF120K0000	J	Peaking 12µH	AB
⚠ L701	RCiLF0096PEZZ	R	Coil	AF
⚠ L751	RCiLP0225CEZZ	J	Coil	AF
L802	VP-DF100K0000	J	Peaking 10µH	AB
L803	VP-DF100K0000	J	Peaking 10µH	AB
L1030	VP-DF100K0000	J	Peaking 10µH	AB
L1050	VP-DF100K0000	J	Peaking 10µH	AB
L1051	VP-DF100K0000	J	Peaking 10µH	AB
SF201	RFiLC0405CEZZ	J	S.A.W Filter	AH

TRANSFORMERS

⚠ T601	RTRNZ0144PEZZ	R	Transformer	AE
⚠ T602	RTRNF0229PEZZ or RTRNF0231PEZZ	X	H-Volt Transformer	AU
⚠ T701	RTRNW0015PEZZ	X	Transformer	AK

CAPACITORS

[EL. …Electrolytic, M-Poly. …Metalized Polypro Film]

C201	VCEA0A1CW476M	J	47	16V	EL.	AB
C202	VCEA0A1AW337M+	X	330	10V	EL.	AE
C205	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C206	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C207	VCKYCY1HB103K	J	0.01	50V	Ceramic	AA
C208	VCKYCY1HB103K	J	0.01	50V	Ceramic	AA
C209	VCKYCY1HB103K	J	0.01	50V	Ceramic	AA
C210	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C211	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C231	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C232	VCKYCY1HB821K	J	820p	50V	Ceramic	AA
C233	VCKYCY1HB472K	J	4700p	50V	Ceramic	AA
C234	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C251	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C252	VCEA0A1CW107M	J	100	16V	EL.	AC
C301	VCEA0A1CW477M	J	470	16V	EL. (20LK32)	AC
C301	RC-EZA009WJZZ+	X	220	16V	EL. (20LK62)	AF
C302	VCEA0A1CW477M	J	470	16V	EL. (20LK62)	AC
C303	VCEA0A1CW477M	J	470	16V	EL. (20LK62)	AC
C304	VCEA0A1CW106M	J	10	16V	EL.	AB
C305	VCEA0A1HW475M	J	4.7	50V	EL. (20LK62)	AB
C306	VCEA0A1HW105M	J	1.0	50V	EL. (20LK62)	AB
C307	VCEA0A1HW105M	J	1.0	50V	EL. (20LK32)	AB
C307	VCEA0A1HW224M	J	0.22	50V	EL. (20LK62)	AB
C308	VCKYCY1CB473K	J	0.047	16V	Ceramic (20LK62)	AA
C310	VCEA0A1HW225M	J	2.2	50V	EL. (20LK32)	AB
C311	VCEA0A1HW105M	J	1.0	50V	EL. (20LK32)	AB
C311	RC-EZA008WJZZ+	X	100	16V	EL. (20LK62)	AE
C312	VCEA0A1HW225M	J	2.2	50V	EL. (20LK32)	AB
C312	VCEA0A1HW224M	J	0.22	50V	EL. (20LK62)	AB
C313	VCKYCY1CB473K	J	0.047	16V	Ceramic (20LK62)	AA
C313	VCKYCY1HB332K	J	3300p	50V	Ceramic (20LK32)	AA
C314	VCEAKA1HW224M	J	0.22	50V	EL. (20LK62)	AB
⚠ C332	VCQYTA1HM103J	J	0.01	50V	Mylar	AA
⚠ C333	VCEA0A1CW108M	J	1000	16V	EL. (20LK32)	AD
⚠ C333	RC-EZ1086CEZZ	J	1000	16V	EL. (20LK62)	AD
C356	VCKYCY1HB472K	J	4700p	50V	Ceramic (20LK32)	AA
C359	VCEA0A1CW106M	J	10	16V	EL.	AB
C360	VCEA0A1HW225M	J	2.2	50V	EL. (20LK32)	AB
C409	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C410	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C411	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C501	VCKYPA1HB102K	J	1000p	50V	Ceramic	AA
C504	VCKYCY1HB103K	J	0.01	50V	Ceramic	AA
C505	VCEA0A1HW107M	J	100	50V	EL.	AB
C507	VCKYCY1HB103K	J	0.01	50V	Ceramic	AA
C508	VCFYSA1JB224J	X	0.22	63V	Mylar	AF
C509	VCEA0A1CW477M	J	470	16V	EL.	AC
C510	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C514	VCFYSA1JB473J	J	0.047	63V	Mylar	AC
C531	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C532	VCKYCY1HB102K	J	1000p	50V	Ceramic	AA
C533	VCQYTA1HM104J	J	0.1	50V	Mylar	AA
C601	VCQYTA1HM563J	J	0.056	50V	Mylar	AB
C602	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C603	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C604	VCEA0A2EW106M	J	10	250V	EL.	AD
C605	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C606	VCFPVC2DB474J	J	0.47	200V	M-Poly.	AE
C607	VCFPVC3ZA772H	J	7700p	1.8kV	M-Poly.	AD
C608	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C610	VCEA0A1CW108M	J	1000	16V	EL.	AD
C611	VCEA0A1EW476M	J	47	25V	EL.	AB
C612	VCEA0A1CW477M	J	470	16V	EL.	AC
C620	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C640	VCFYSB2EB823J	J	0.082	250V	Mylar	AD
C651	VCQYTA1HM222J	J	2200p	50V	Mylar	AA
C652	VCQYTA1HM472J	J	4700p	50V	Mylar	AB
C653	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C654	VCKYCY1HF223Z	J	0.022	50V	Ceramic	AB
C655	VCEA0A1HW106M	J	10	50V	EL.	AB
C656	VCEA0A1HW224M	J	0.22	50V	EL.	AB
C657	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
C658	VCKYCY1EF104Z	J	0.1	25V	Ceramic	AA
⚠ C701	RC-FZ036SCEZZ	J	0.1	275V	Plastic	AC
C702	RC-KZ0029CEZZ	J	0.01	250V	Ceramic	AC
C703	RC-KZ0029CEZZ	J	0.01	250V	Ceramic	AC
C704	RC-KZ0029CEZZ	J	0.01	250V	Ceramic	AC
C705	RC-EZ0804CEZZ	J	220	400V	EL.	AU
C709	RC-KZ0039CEZZ	J	680	2kV	Ceramic	AB
C710	VCEA0A1HW476M	J	47	50V	EL.	AB
C711	VCKYPA1HB102K	J	1000p	50V	Ceramic	AA
C712	VCKYPA1HB471K	J	470p	50V	Ceramic	AA
⚠ C751	RC-KZ0092GEZZ	J	3300p	AC250V	Ceramic	AC
⚠ C752	VCKYPH3DB561K	J	560p	2kV	Ceramic	AC
⚠ C753	RC-EZ0724CEZZ	J	100	160V	EL.	AG
⚠ C754	RC-EZ0638CEZZ	J	33	160V	EL.	AG
⚠ C755	VCEA0A1CW108M	J	1000	16V	EL.	AD
⚠ C756	VCQYTA1HM103J	J	0.01	50V	Mylar	AA
C759	VCEA0A0JW477M	J	470	6.3V	EL.	AC
C760	VCEA0A0JW228M	J	2200	6.3V	EL.	AD
C801	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C802	VCEA0A1CW337M	J	330	16V	EL.	AC
C803	VCEA0A1CW107M	J	100	16V	EL.	AC
C804	VCKYCY1HB222K	J	2200p	50V	Ceramic	AA
C805	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C806	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C807	VCKYD41HB102K	J	1000p	50V	Ceramic	AA
C808	VCEA0A1CW107M	J	100	16V	EL.	AC
C809	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C810	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C811	VCEA0A1CW107M	J	100	16V	EL.	AC
C812	VCFYFA1HA224J	J	0.22	50V	Mylar	AB
C813	VCFYFA1HA224J	J	0.22	50V	Mylar	AB
C814	VCKYCY1HB471K	J	470p	50V	Ceramic	AA
C816	VCKYCY1HB471K	J	470p	50V	Ceramic	AA
C1001	VCEA0A0JW107M	J	100	6.3V	EL.	AB
C1002	VCEA0A0JW107M	J	100	6.3V	EL.	AB

Ref. No.	Part No.	★			Description	Code

PWB-A: DUNTK541WEA2 (20LK32)
PWB-A: DUNTK541WEA3 (20LK62)
MAIN UNIT (Continued)

C1003	VCEA0A1CW106M	J	10	16V	EL.	AB
C1004	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C1005	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C1006	VCEA0A1CW106M	J	10	16V	EL.	AB
C1008	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C1009	VCCCCY1HH330J	J	33p	50V	Ceramic	AA
C1010	VCEA0A0JW107M	J	100	6.3V	EL.	AB
C1011	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C1012	VCKYCY1CF474Z	J	0.47	16V	Ceramic	AB
C1013	VCEA0A0JW107M	J	100	6.3V	EL.	AB
C1016	VCQYTA1HM104J	J	0.1	50V	Mylar	AA
C1018	VCKYCY1HB221K	J	220p	50V	Ceramic	AA
C1024	VCQYTA1HM104J	J	0.1	50V	Mylar	AA
C1026	VCEA0A0JW107M	J	100	6.3V	EL.	AB

RESISTORS

[M-Ox. …Metal Oxide, M-Film …Metal Film]

RJ1	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK62)	AA
RJ2	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ4	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ5	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK62)	AA
RJ8	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ9	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ10	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ13	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ14	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ15	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ16	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ17	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ19	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ21	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ23	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK62)	AA
RJ24	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ26	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ28	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ32	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ33	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK32)	AA
RJ34	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK62)	AA
RJ35	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK32)	AA
RJ37	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ38	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ41	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ42	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ43	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ46	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ49	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ50	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ51	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ52	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ53	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ55	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ70	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ71	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ73	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ75	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ76	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
RJ77	VRS-CY1JF000J	J	0	1/16W	M-Ox.	AA
R201	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R202	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R205	VRS-CY1JF680J	J	68	1/16W	M-Ox.	AA
R206	VRS-CY1JF122J	J	1.2k	1/16W	M-Ox.	AA
R207	VRS-CY1JF221J	J	220	1/16W	M-Ox.	AA
R208	VRS-CY1JF122J	J	1.2k	1/16W	M-Ox.	AA
R209	VRS-CY1JF392J	J	3.9k	1/16W	M-Ox.	AA
R216	VRS-RG3LB223J+	X	22k	3W	M-Ox.	AF
R219	VRD-RA2BE392J	J	3.9k	1/8W	Carbon	AA
R220	VRS-CY1JF221J	J	220	1/16W	M-Ox.	AA
R230	VRS-CY1JF473J	J	47k	1/16W	M-Ox.	AA
R231	VRD-RA2BE681J	J	680	1/8W	Carbon	AA
R232	VRS-CY1JF272J	J	2.7k	1/16W	M-Ox.	AA
R233	VRS-CY1JF101J	J	100	1/16W	M-Ox.	AA
R234	VRS-CY1JF391J	J	390	1/16W	M-Ox.	AA
R257	VRS-CY1JF181J	J	180	1/16W	M-Ox.	AA
R258	VRS-CY1JF181J	J	180	1/16W	M-Ox.	AA
R259	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R260	VRS-CY1JF392J	J	3.9k	1/16W	M-Ox.	AA
R261	VRS-CY1JF223J	J	22k	1/16W	M-Ox.	AA
R262	VRS-CY1JF560J	J	56	1/16W	M-Ox.	AA
R263	VRS-CY1JF560J	J	56	1/16W	M-Ox.	AA
R301	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK32)	AA
R304	VRS-CY1JF221J	J	220	1/16W	M-Ox. (20LK62)	AA
R304	VRS-CY1JF683J	J	68k	1/16W	M-Ox. (20LK32)	AA
R305	VRS-CY1JF274J	J	270k	1/16W	M-Ox.	AA
R306	VRD-RA2BE391J	J	390	1/8W	Carbon (20LK62)	AA
R307	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK32)	AA
R307	VRS-CY1JF122J	J	1.2k	1/16W	M-Ox. (20LK62)	AA
R308	VRD-RA2BE103J	J	10k	1/8W	Carbon (20LK62)	AA
R309	VRD-RA2BE473J	J	47k	1/8W	Carbon (20LK62)	AA
R310	VRS-CY1JF473J	J	47k	1/16W	M-Ox. (20LK32)	AA
R311	VRS-CY1JF473J	J	47k	1/16W	M-Ox.	AA
R313	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox. (20LK32)	AA
R314	VRS-CY1JF103J	J	10k	1/16W	M-Ox.	AA
R315	VRS-CY1JF122J	J	1.2k	1/16W	M-Ox. (20LK62)	AA
R315	VRS-CY1JF822J	J	8.2k	1/16W	M-Ox. (20LK32)	AA
R316	VRS-CY1JF104J	J	100k	1/16W	M-Ox. (20LK62)	AA
R322	VRS-CY1JF272J	J	2.7k	1/16W	M-Ox. (20LK32)	AA
R323	VRD-RA2BE274J	J	270k	1/8W	Carbon (20LK32)	AA
R333	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK32)	AA
R334	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox.	AA
R335	VRS-CY1JF564J	J	560k	1/16W	M-Ox.	AA
R336	VRD-RA2BE332J	J	3.3k	1/8W	Carbon (20LK62)	AA
R337	VRS-CY1JF564J	J	560k	1/16W	M-Ox. (20LK62)	AA
R340	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK62)	AA
R341	VRS-CY1JF822J	J	8.2k	1/16W	M-Ox. (20LK62)	AA
R362	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox. (20LK62)	AA
R363	VRS-CY1JF564J	J	560k	1/16W	M-Ox. (20LK62)	AA
R364	VRS-CY1JF000J	J	0	1/16W	M-Ox. (20LK32)	AA
R364	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox. (20LK62)	AA
R365	VRS-CY1JF564J	J	560k	1/16W	M-Ox. (20LK62)	AA
R401	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK62)	AA
R430	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK62)	AA
R431	VRS-CY1JF101J	J	100	1/16W	M-Ox. (20LK32)	AA

PWB-A: DUNTK541WEA2 (20LK32)
PWB-A: DUNTK541WEA3 (20LK62)
MAIN UNIT (Continued)

Ref. No.	Part No.	★	Description	Code
R432	VRS-CY1JF750J	J	75 1/16W M-Ox.	AA
R433	VRS-CY1JF103J	J	10k 1/16W M-Ox. (20LK62)	AA
R464	VRS-CY1JF750J	J	75 1/16W M-Ox. (20LK62)	AA
R501	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R502	VRD-RM2HD102J	J	1.0k 1/2W Carbon	AA
R503	VRN-RL3DB2R2J+	X	2.2 2W M-Film	AE
R504	VRS-CY1JF181J	J	180 1/16W M-Ox.	AA
R505	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R506	VRS-RG3AB391J	X	390 1W M-Ox.	AE
R507	VRN-RL3AB1R0J	X	1.0 1W M-Film	AE
R510	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R511	VRS-CY1JF181J	J	180 1/16W M-Ox.	AA
R512	VRD-RM2HD100J	J	10 1/2W Carbon	AA
R531	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R532	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R533	VRD-RA2BE393J	J	39k 1/8W Carbon	AA
R601	VRS-RG2HC102J	J	1.0k 1/2W M-Ox.	AA
R602	VRD-RA2BE393J	J	39k 1/8W Carbon	AA
R603	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R604	VRD-RA2BE393J	J	39k 1/8W Carbon	AA
R605	VRD-RM2HD823J	J	82k 1/2W Carbon	AA
⚠ R606	VRN-RL3AB2R2J	X	2.2 1W M-Film	AE
⚠ R607	VRD-RM2HD270J	J	27 1/2W Carbon	AA
⚠ R609	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
⚠ R610	VRD-RA2BE102G	J	1.0k 1/8W Carbon	AB
R611	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R612	VRS-CY1JF123J	J	12k 1/16W M-Ox.	AA
R613	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
⚠ R614	VRD-RM2HD100J	J	10 1/2W Carbon	AA
R615	VRS-RG3DB682J+	X	6.8k 2W M-Ox.	AE
R616	VRN-RL3ABR47J+	X	0.47 1W M-Film	AE
R618	VRS-RG3DB391J+	X	390 2W M-Ox.	AE
R619	VRS-RG3LB562J	X	5.6k 3W M-Ox.	AF
R620	VRS-RG3AB472J+	X	4.7k 1W M-Ox.	AE
R622	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
R625	VRN-VV3DB4R7J	J	4.7 2W M-Film	AB
R626	VRD-RM2HD470J	J	47 1/2W Carbon	AA
R641	VRN-RL2HCR47J+	X	0.47 1/2W M-Film	AE
R651	VRS-CY1JF223J	J	22k 1/16W M-Ox.	AA
R652	VRS-CY1JF102J	J	1.0k 1/16W M-Ox.	AA
R653	VRS-CY1JF822J	J	8.2k 1/16W M-Ox.	AA
R654	VRS-CY1JF273J	J	27k 1/16W M-Ox.	AA
R655	VRS-CY1JF391J	J	390 1/16W M-Ox.	AA
R656	VRS-CY1JF100J	J	10 1/16W M-Ox.	AA
R658	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R663	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R701	VRW-KQ3NC3R9K	J	3.9 7W Cement	AE
R704	VRN-SV2HC1R0J	J	1.0 1/2W M-Film	AA
R707	VRS-VV3DB104J	J	100k 2W M-Ox.	AB
R708	VRD-RA2BE681J	J	680 1/8W Carbon	AA
R709	VRN-RL3DBR47J+	X	0.47 2W M-Film	AE
R710	VRN-RL3DBR39J	X	0.39 2W M-Film	AE
R711	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R712	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA
R716	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
⚠ R751	RR-DZ0049CEZZ	J	3.9M 1/2W Solid	AB
⚠ R752	RR-DZ0049CEZZ	J	3.9M 1/2W Solid	AB
⚠ R753	VRD-RM2HD124J	J	120k 1/2W Carbon	AA
R754	VRD-RM2HD150J	J	15 1/2W Carbon	AA
R755	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R756	VRD-RM2HD270J	J	27 1/2W Carbon	AA
R757	VRS-CY1JF151J	J	150 1/16W M-Ox.	AA
R801	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R802	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R803	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R804	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R805	VRS-CY1JF822J	J	8.2k 1/16W M-Ox.	AA
R806	VRS-CY1JF123J	J	12k 1/16W M-Ox.	AA
R807	VRS-CY1JF103J	J	10k 1/16W M-Ox.	AA
R808	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R809	VRD-RA2BE224J	J	220k 1/8W Carbon	AA
R812	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R813	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R1002	VRS-CY1JF822J	J	8.2k 1/16W M-Ox.	AA
R1003	VRS-CY1JF562J	J	5.6k 1/16W M-Ox.	AA
R1006	VRS-CY1JF562J	J	5.6k 1/16W M-Ox.	AA
R1007	VRS-CY1JF562J	J	5.6k 1/16W M-Ox.	AA
R1008	VRS-CY1JF822J	J	8.2k 1/16W M-Ox.	AA
R1009	VRS-CY1JF562J	J	5.6k 1/16W M-Ox.	AA
R1011	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1012	VRD-RA2BE391J	J	390 1/8W Carbon	AA
R1013	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R1014	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1015	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1016	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1017	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1019	VRS-CY1JF000J	J	0 1/16W M-Ox.	AA
R1020	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1021	VRS-CY1JF183J	J	18k 1/16W M-Ox.	AA
R1022	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1023	VRS-CY1JF221J	J	220 1/16W M-Ox.	AA
R1024	VRS-CY1JF183J	J	18k 1/16W M-Ox.	AA
R1025	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1026	VRS-CY1JF224J	J	220k 1/16W M-Ox.	AA
R1028	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1032	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1034	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1035	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1036	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1037	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1038	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1039	VRS-CY1JF223J	J	22k 1/16W M-Ox.	AA
R1040	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1041	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1042	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R1046	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1047	VRS-CY1JF332J	J	3.3k 1/16W M-Ox.	AA
R1050	VRS-CY1JF392J	J	3.9k 1/16W M-Ox.	AA
R1051	VRS-CY1JF683J	J	68k 1/16W M-Ox.	AA
R1066	VRS-CY1JF472J	J	4.7k 1/16W M-Ox.	AA
R1072	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
R1073	VRS-CY1JF101J	J	100 1/16W M-Ox.	AA
JA223	VRD-RA2BE222J	J	2.2k 1/8W Carbon (20LK62)	AA
JA721	VRD-RA2BE102J	J	1.0k 1/8W Carbon (20LK32)	AA

SWITCHES

S1001	QSW-K0003AJZZ	J	CH-UP	AB
S1002	QSW-K0003AJZZ	J	CH-DOWN	AB
S1003	QSW-K0003AJZZ	J	VOL-UP	AB
S1004	QSW-K0003AJZZ	J	VOL-DOWN	AB
S1005	QSW-K0003AJZZ	J	PICTURE/PRESET	AB
S1006	QSW-K0114CEZZ	J	POWER	AE

MISCELLANEOUS PARTS

⚠ F701	QFS-C3229CEZZ	J	Fuse, T3.14AL	AD
FB601	RBLN-0091GEZZ	J	Ferrite Bead	AB
FH701	QFSHD1013CEZZ	J	Fuse Holder	AC
FH702	QFSHD1014CEZZ	J	Fuse Holder	AC
J402	QJAKE0210CE04	X	Jack, Video (AV-In2) (20LK32)	AF
J402	QJAKE0211CE04	X	Jack, Video (AV-In2) (20LK62)	AF
J403	QJAKE0210CE09	X	Jack, Audio (L)(AV-In2) (20LK32)	AF
J403	QJAKE0211CE09	X	Jack, Audio (L)(AV-In2) (20LK62)	AF
J404	QJAKE0210CE02	X	Jack, Audio (R)(AV-In2) (20LK62)	AF
J409	QJAKF0074CEZZ	X	Jack, Rear AV-In (20LK32)	AG
J409	QJAKG0093CEZZ	X	Jack, Rear AV-In (20LK62)	AK
P302	QPLGN0461CEZZ	J	Plug, 4-pin (S)	AB
P601	QPLGN0660CEZZ	J	Plug, 6-pin (K)	AC

Ref. No.	Part No.	★	Description	Code

PWB-A: DUNTK541WEA2 (20LK32)
PWB-A: DUNTK541WEA3 (20LK62)
MAIN UNIT (Continued)

P603	QPLGN0361CEZZ	J	Plug, 3-pin (TP651-3)	AB
P701	QPLGN0260CEZZ	J	Plug, 2-pin (M)	AC
P702	QPLGN0269GEZZ	J	Plug, 2-pin	AB
P1002	QPLGN0561CEZZ	J	Plug, 5-pin (BC)	AB
RMC1001	RRMCU0222CEZZ	J	R/C Receiver	AL
RDA301	PRDAR0119GJFW	X	Heat Sink, for IC301 (20LK32)	AD
RDA301	PRDAR0120GJFW	X	Heat Sink, for IC301 (20LK62)	AD
RDA501	PRDAR0118GJFW	X	Heat Sink, for IC501	AE
RDA602	PRDAR0224PEFW	R	Heat Sink, for Q602	AF
RDA701	PRDAR0298PEFW	R	Heat Sink, for IC701	AF
TP201	QLUGP0102PEZZ	R	Lug, Test Point	AA
	LHLDP1066PE00	R	Holder	AC
	LHLDW1104PEZZ	X	Holder	AE
	LHLDW1105PEZZ	X	Holder	AE
	LX-BZ0086TAFD	J	Screw	AA
	LX-BZ3049GEFD	J	Screw	AA
	LX-TZ3004CEFD	J	Screw	AA
	QCNW-2619PEZZ	X	Connecting Cord	AD
	QCNW-2620PEZZ	X	Connecting Cord	AD

Ref. No.	Part No.	★	Description	Code

PWB-B: DUNTK542WEA1
CRT UNIT

TRANSISTORS

Q870	RH-TX0110BMZZ+	X	TX0110BM	AE
Q871	RH-TX0110BMZZ+	X	TX0110BM	AE
Q872	RH-TX0110BMZZ+	X	TX0110BM	AE
Q883	RH-TX0124BMZZ+	X	TX0110BM	AE
Q885	RH-TX0124BMZZ+	X	TX0124BM	AE
Q887	RH-TX0124BMZZ+	X	TX0124BM	AE

DIODES

D881	VHD1SS119//-1	J	Diode	AB
D882	VHD1SS119//-1	J	Diode	AB
D883	VHD1SS119//-1	J	Diode	AB
D884	VHD1SS119//-1	J	Diode	AB
D885	VHD1SS119//-1	J	Diode	AB

CAPACITORS

[EL. …Electrolytic]

C871	VCCSCY1HL471J	J	470p	50V	Ceramic	AA
C872	VCCSCY1HL471J	J	470p	50V	Ceramic	AA
C873	VCCSCY1HL471J	J	470p	50V	Ceramic	AA
C875	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA
C876	RC-KZ0150CEZZ	J	1000p	3kV	Ceramic	AB
C878	VCEA0A2EW106M	J	10	250V	EL.	AD
C880	VCCSCY1HL471J	J	470p	50V	Ceramic	AA
C881	VCKYPA1HB471K	J	470p	50V	Ceramic	AA
C882	VCKYPA1HB471K	J	470p	50V	Ceramic	AA
C886	VCKYPA2HB102K	J	1000p	500V	Ceramic	AA

RESISTORS

[M-Ox. …Metal Oxide]

R879	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R880	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R881	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R882	VRS-VV3DB153J	J	15k	2W	M-Ox.	AA
R883	VRD-RM2HD272J	J	2.7k	1/2W	Carbon	AA
R884	VRS-VV3DB153J	J	15k	2W	M-Ox.	AA
R885	VRD-RM2HD272J	J	2.7k	1/2W	Carbon	AA
R886	VRS-VV3DB153J	J	15k	2W	M-Ox.	AA
R887	VRD-RM2HD272J	J	2.7k	1/2W	Carbon	AA
R888	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R892	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R893	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R894	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R898	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA
R899	VRS-CY1JF471J	J	470	1/16W	M-Ox.	AA

MISCELLANEOUS PARTS

⚠ SC881	QSOCV0840CEZZ or QSOCV0841CEZZ	J	CRT Socket		AK

Ref. No.	Part No.	★	Description	Code

PWB-E: DUNTK545WEA0 (20LK62)
MTS MODULE UNIT

INTEGRATED CIRCUITS

IC3001	VHiCXA2074Q-1	J	CXA2074Q	AY
IC3002	VHiMM1501XN-1	X	MM1501XNRE	AH

TRANSISTORS

Q3003	VS2SC3198-G-1	J	C3198-G	AA

DIODE

D3001	RH-EX0632GEZZ	J	Zener Diode, 9.9V	AA

CAPACITORS

[EL. …Electrolytic]

C3001	VCE9GA1HW475M	J	4.7	50V	EL. (N.P)	AB
C3002	VCKYCY1HB562K	J	5600p	50V	Ceramic	AA
C3003	VCQYTA1HM123K	J	0.012	50V	Mylar	AA
C3004	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C3005	VCEA9A1HW475M	J	4.7	50V	EL.	AB
C3006	VCEA0A1CW106M	J	10	16V	EL.	AB
C3007	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C3008	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C3009	VCEA0A1CW227M	J	220	16V	EL.	AC
C3010	VCE9GA1HW475M	J	4.7	50V	EL. (N.P)	AB
C3011	VCEA0A1HW475M	J	4.7	50V	EL.	AB
C3012	VCE9GA1HW475M	J	4.7	50V	EL. (N.P)	AB
C3013	VCKYCY1HB272K	J	2700p	50V	Ceramic	AA
C3014	VCQYTA1HM473K	J	0.047	50V	Mylar	AB
C3015	VCEACA1HC335K	X	3.3	50V	EL.	AF
C3016	VCE9GA1HW475M	J	4.7	50V	EL. (N.P)	AB
C3017	VCEACA1CC106K	J	10	16V	EL.	AC
C3018	VCEA0A1HW105M	J	1.0	50V	EL.	AB
C3019	VCEA0A1CW106M	J	10	16V	EL.	AB
C3020	VCEA0A1CW106M	J	10	16V	EL.	AB
C3021	VCEA0A1CW106M	J	10	16V	EL.	AB
C3022	VCEA0A1CW106M	J	10	16V	EL.	AB
C3031	VCEA0A1CW106M	J	10	16V	EL.	AB
C3032	VCEA0A1CW106M	J	10	16V	EL.	AB
C3033	VCKYCY1HF103Z	J	0.01	50V	Ceramic	AA
C3034	VCEA0A1HW224M	J	0.22	50V	EL.	AB
C3039	VCEA0A1CW227M	J	220	16V	EL.	AC

RESISTORS

[M-Ox. …Metal Oxide]

R3001	VRD-RA2BE221J	J	220	1/8W	Carbon	AA
R3002	VRD-RA2BE221J	J	220	1/8W	Carbon	AA
R3003	VRS-CY1JF105J	J	1.0M	1/16W	M-Ox.	AA
R3004	VRS-CY1JF104J	J	100k	1/16W	M-Ox.	AA
R3005	VRS-CY1JF623J	J	62k	1/16W	M-Ox.	AA
R3007	VRS-CY1JF332J	J	3.3k	1/16W	M-Ox.	AA
R3008	VRS-CY1JF302J	J	3.0k	1/16W	M-Ox.	AA
R3010	VRS-CY1JF392J	J	3.9k	1/16W	M-Ox.	AA
R3011	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R3012	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R3013	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R3014	VRS-CY1JF102J	J	1.0k	1/16W	M-Ox.	AA
R3015	VRD-RA2BE101J	J	100	1/8W	Carbon	AB
R3022	VRD-RA2BE560J	J	56	1/8W	Carbon	AA
R3023	VRD-RM2HD5R6J	J	5.6	1/2W	Carbon	AA
R3025	VRS-CY1JF472J	J	4.7k	1/16W	M-Ox.	AA

MISCELLANEOUS PARTS

P3001	QPLGZ0810CEZZ	J	Plug, 8-pin (M)	AD
P3002	QPLGZ0810CEZZ	J	Plug, 8-pin (SW)	AD
P3003	QPLGZ0810CEZZ	J	Plug, 8-pin (N)	AD

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠ ACC701	QACCZ3008PEZZ	R	AC Cord	AN
SP301	VSP9050PB40YA	X	Speaker (R)(20LK32)	AK
SP302	VSP9050PB40YA	X	Speaker (L)(20LK32)	AK
SP301	VSP9050PB394A	X	Speaker (R)(20LK62)	AK
SP302	VSP9050PB394A	X	Speaker (L)(20LK62)	AK
	LHLDK0012PEZZ	R	AC Cord Holder	AC
	LHLDW1003PEZZ	R	Holder	AA
	LHLDW1009PEZZ	R	Holder	AA
	LHLDW1033PEZZ	R	Holder	AA
	LHLDW1060CEZZ	R	Holder	AB
	LHLDW1104PEZZ	X	Holder	AE
	LHLDW1105PEZZ	X	Holder	AE
	LHLDZ0063PEZZ	R	Holder	AD
	LX-TZ0104GJFD	X	CRT Screw, x4	AF
	LX-WZ0102GJFD	X	CRT Washer, x4	AE
	LHLDW1070PEKZ	J	Holder	AD
	LHLDZ1002GJZZ	X	Holder	AE
	LHLDZ1003GJZZ	X	Holder	AF
	LX-TZ3004CEFD	J	Screw	AA
	PSPAH0117GJ00	X	Spacer	AD
	PSPAH0118GJ00	X	Spacer	AD
	QCNW-2562PEZZ	J	Connecting Cord	AF
	TCAUH0102GJZZ	X	AV Notice Label (20LK32)	AE
	TCAUS3000GJZZ	X	Caution Card	AB
	TLABM0005GJZZ	X	Model Label	AF
	TLABZ0166GJZZ	X	Case Label (20LK32)	AE
	TLABZ0167GJZZ	X	Case Label (20LK62)	AE
	XTASD40P20000	J	Screw	AA

SUPPLIED ACCESORRIES

Part No.	★	Description	Code
QPLGA0017CEZZ	J	AC Plug Adapter	AK
RRMCG1339CESB	X	Infrared R/C Unit	AP
TiNS-7437GJZZ	X	Operation Manual	AP

PACKING PARTS
(NOT REPLACEMANT ITEM)

Part No.	★	Description	Code
SPAKC0208GJZZ	–	Packing Case	—
SPAKP0102GJZZ	–	Wrapping Paper	—
SPAKX0124GJZZ	–	Buffer Material	—
SSAKA0101GJZZ	–	Polyethylene Bag	—

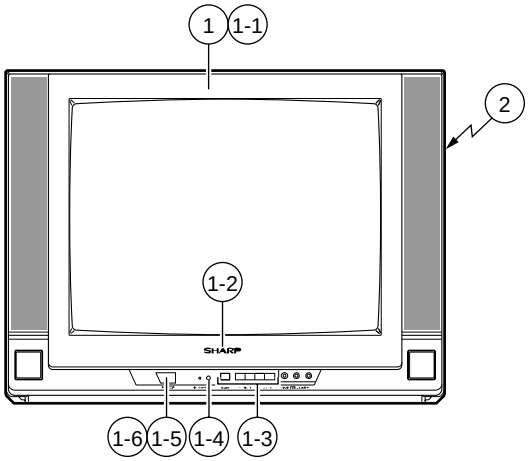
CABINET PARTS

20LK32

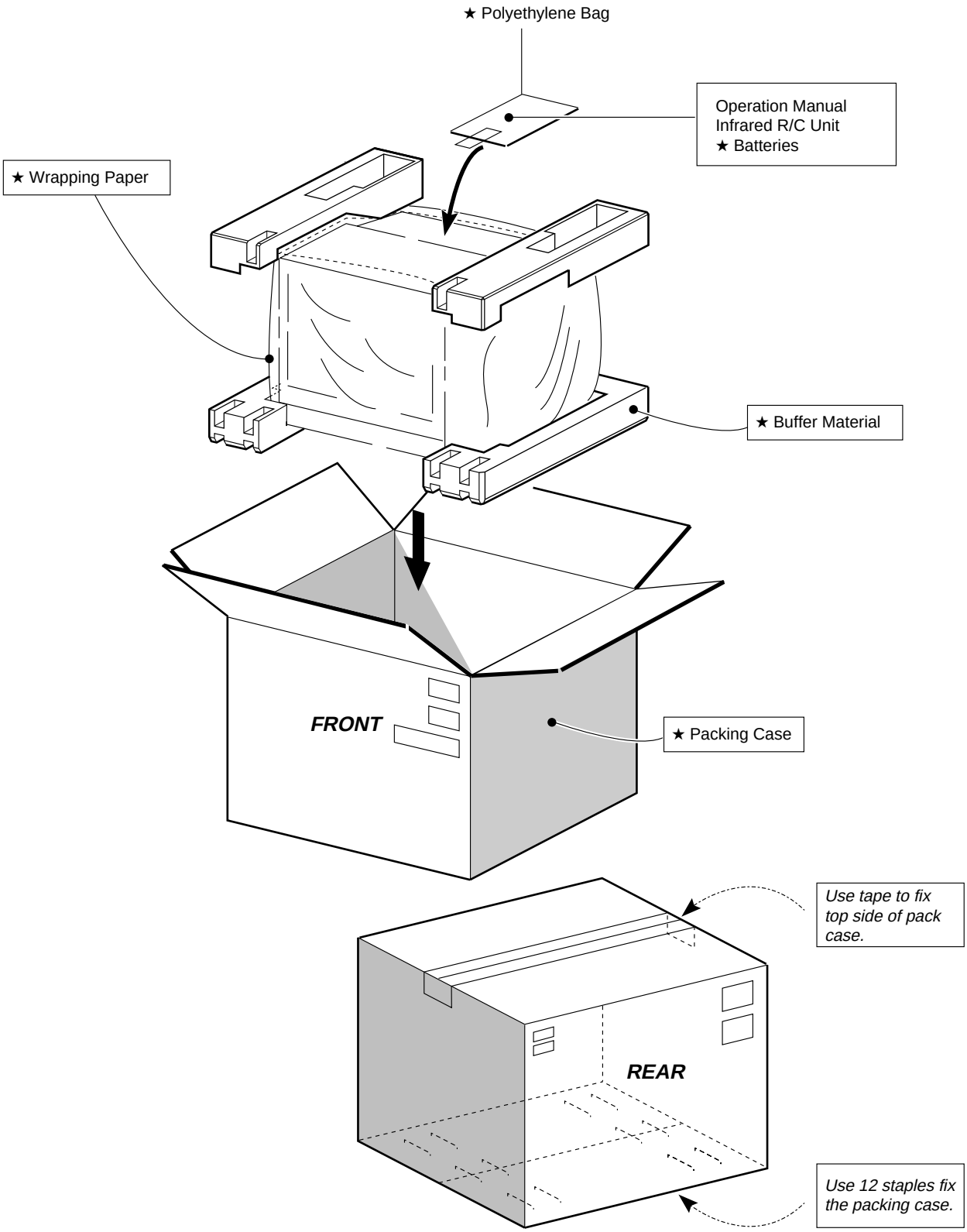
Ref. No.	Part No.	★	Description	Code
1	CCABA0139WEH0	X	Front Cabinet Ass'y	BB
1-1	*Not Available*	–	Front Cabinet	—
1-4	GCOVA0110GJSA	X	Cover for LED, R/C	AG
1-2	HBDGB1001GJSA	X	Badge, "SHARP"	AE
1-3	JBTN-0114GJSA	X	Button, Menu, CH-up/down, Vol-up/down	AG
1-5	JBTN-0113GJSA	X	Button, Power	AG
1-6	MSPRC0005PEFW	J	Spring for Power Button	AB
2	GCABB0128GJKA	X	Rear Cabinet	AY

20LK62

Ref. No.	Part No.	★	Description	Code
1	CCABA0140WEH0	X	Front Cabinet Ass'y	BB
1-1	*Not Available*	–	Front Cabinet	—
1-4	GCOVA0110GJSA	X	Cover for LED, R/C	AG
1-2	HBDGB1001GJSA	X	Badge, "SHARP"	AE
1-3	JBTN-0114GJSA	X	Button, Menu, CH-up/down, Vol-up/down	AG
1-5	JBTN-0113GJSA	X	Button, Power	AG
1-6	MSPRC0005PEFW	J	Spring for Power Button	AB
2	GCABB0129GJKA	X	Rear Cabinet	AY



PACKING OF THE SET



★ **MARK** : Not Replacement Items.

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